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**Intermountain
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General Technical
Report INT-105

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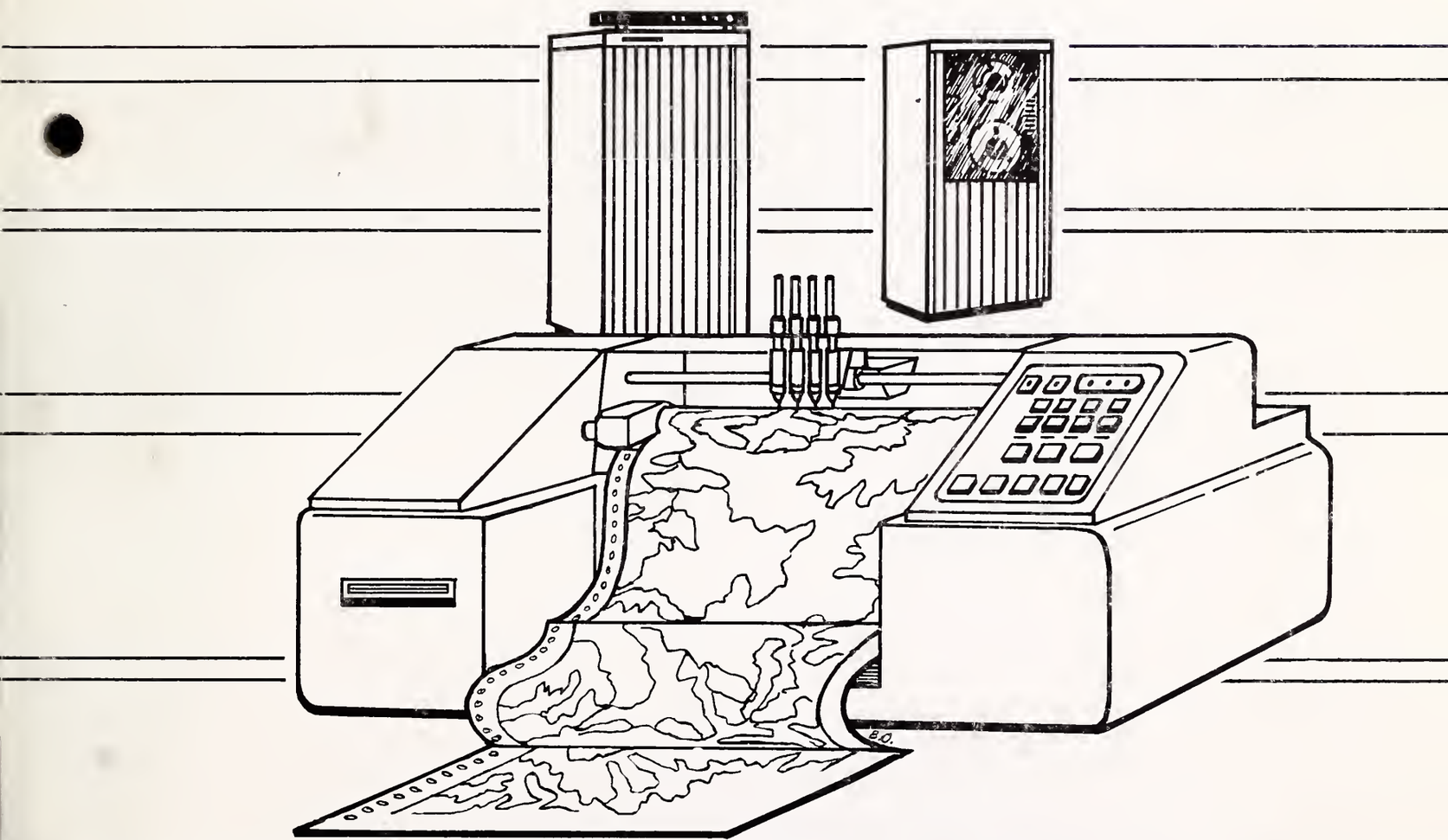
User's Manual: RID*POLY Geographic Information System

Wallace A. Deschene



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User's Manual: RID*POLY Geographic Information System

Wallace A. Deschene

THE AUTHOR

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ACKNOWLEDGMENTS

The original version of RID*POLY, formerly known as the Wildland Resource Information System (WRIS), was designed to operate on a UNIVAC 1108 computer by staff of the Pacific Southwest Forest and Range Experiment Station, USDA Forest Service, Berkeley, Calif. The code was translated to operate on IBM 360/370 computers by Wallace A. Deschene and Roger McCluskey at the Intermountain Forest and Range Experiment Station's Forestry Sciences Laboratory in Moscow, Idaho. RID*POLY is currently running on an AMDAHL 470 V6 computer, with the IBM VS2 MVS Operating System. Robert Russell, David Sharpnack, Joyce Dye, Dave Blakeman, Elliot Amidon, and Mike Travis of Pacific Southwest Station provided generous assistance in the translation tasks. David Erickson and Dan Beus of Intermountain Station in Moscow, Idaho, provided assistance in producing the most recent version of the manual and source code.

Sections of this manual have been reproduced from the UNIVAC 1108 "Wildland Resource Information System: User's Guide" by Russell, Sharpnack, and Amidon.[1] More information on the development and characteristics of WRIS can be obtained from "WRIS: A Resource Information System for Wildland Management" by Russell, Sharpnack, and Amidon.[2]

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[1]Russell, Robert M., David A. Sharpnack, and Elliot L. Amidon. 1975. Wildland Resource Information System: user's guide. USDA For. Serv. Gen. Tech. Rep. PSW-10, 36 p. Pac. Southwest For. and Range Exp. Stn., Berkeley, Calif.

[2]Russell, Robert M., David A. Sharpnack, and Elliot L. Amidon. 1975. WRIS: a resource information system for wildland management. USDA For. Serv. Gen. Tech. Rep. PSW-107, 12 p. Pac. Southwest For. and Range Exp. Stn., Berkeley, Calif.

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0. FOREWORD

The RID*POLY program is the National Forest System version of the Wildland Resource Information System (WRIS) (Russell and others 1975). The RID*POLY program is the polygonal processor of the RID (Resources Information Display) System that stores and manipulates data attributed to geographical areas. The resource manager defines an area by drawing a boundary around it on a map. In nature, such boundaries are irregular in shape. Their shapes are retained within the system by representing them mathematically as multiple-edged polygons. ''Polygons'' are the fundamental building blocks of RID*POLY. They can represent timber stands, management alternatives, soil types, and other entities. RID*POLY has been used primarily for timber management; therefore, examples and terminology in this report are from that discipline. Nevertheless, the system can be used for managing resources other than timber and in fields other than forestry.

A group of polygons forms a ''map.'' The collection of polygons must completely cover the surface area, but not overlap each other. All polygons on one map must be from the same ''layer'' representing one attribute, such as timber type. Other layers, which represent different attributes of the same geographical area, may be constructed. RID*POLY can overlay any two layers to deal with combinations of attributes.

The attribute of a polygon is expressed as a ''label,'' consisting of 1 to 36 characters. Each polygon must have a label. A label does not have to be unique; it may occur many times on a map, once for every polygon containing the same attribute. In addition, RID*POLY assigns each polygon a unique serial number called an ''item number,'' for further identification.

RID*POLY can be used for an entire National Forest by digitizing each of the quadrangle maps needed to cover the forest and by processing the maps as separate units. Each layer is drawn on a separate map sheet. The map sheets are photographically reduced to enable the negatives to fit the dimensions of a densitometer bed or drum (maximum size of 9 inches by 9 inches for SCANDIG).

The scanning operation stores the map on a magnetic tape file in either density or binary form. Density data are processed by a computer program (FREQTB), which prints a grid (binary map) that can be checked for error. The binary map consists of blanks and ones: blanks for the area between lines or background, and ones for the points falling on polygon boundary lines. Binary data are processed by a computer program (BIPRIN), which produces a binary map and performs various editing procedures.

If a map is extremely simple—few boundary lines and most of the scanned points blank—it is more efficient to hand digitize and process it through the HANDY program than use FREQTB or BIPRIN.

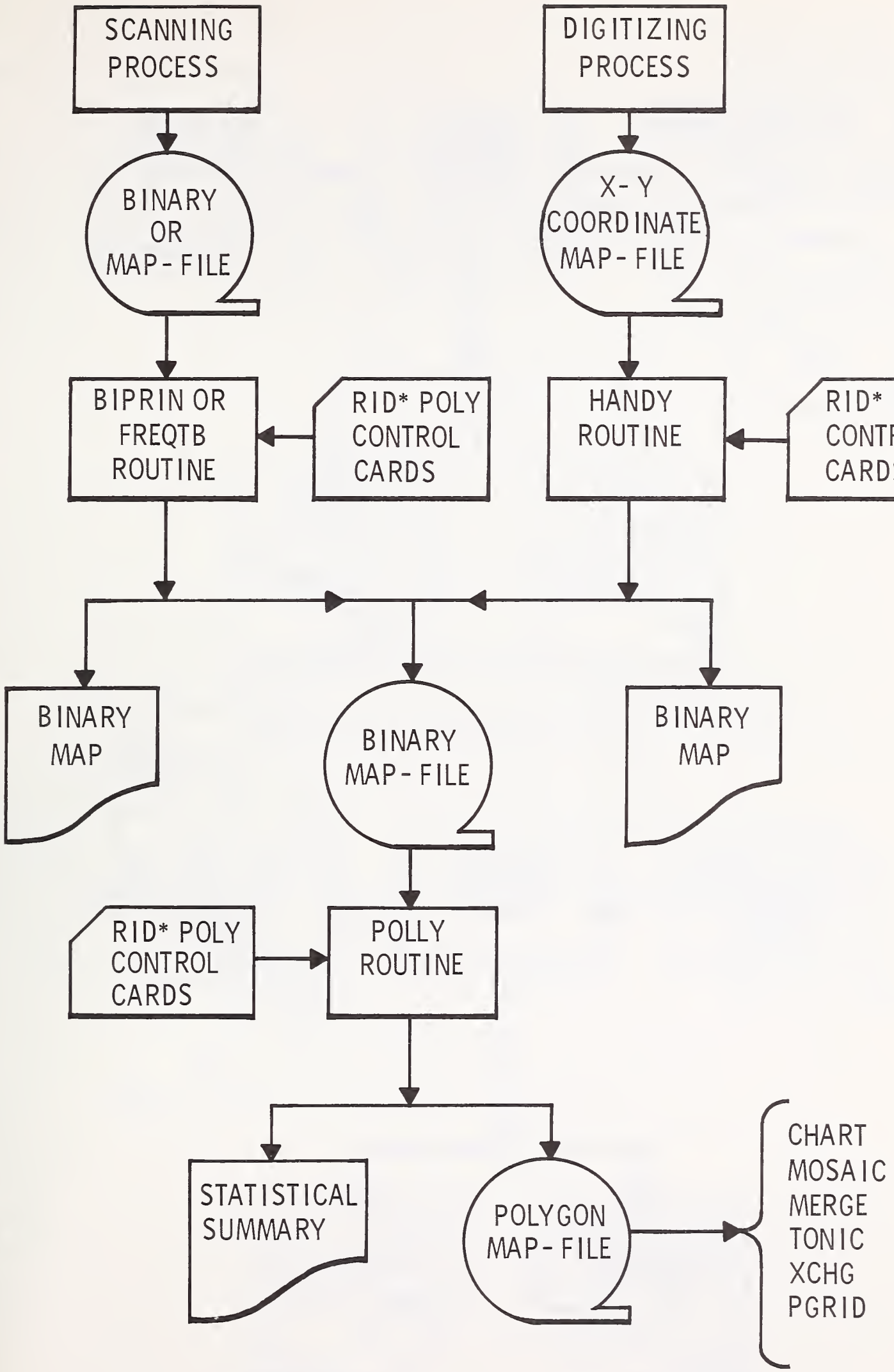
The POLLY program converts a binary map into a file of polygons, (called a polygon map file) and attaches a label to each. A complete data base is formed when the above process is performed for all maps required to cover a designated area.

Table 0.1.—Data recording devices and processing procedures

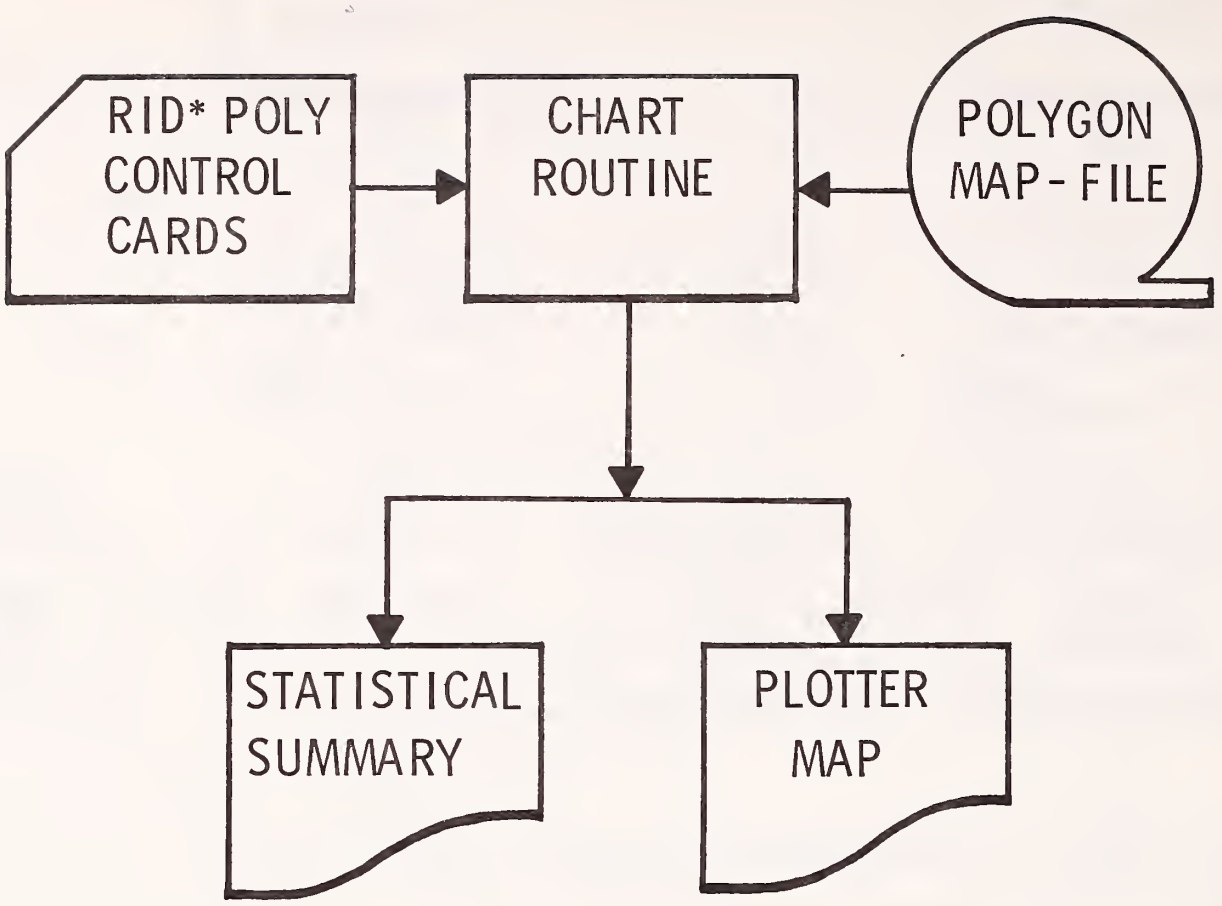
Data recording device	Output mode	Program processing sequence		
SCANDIG Scanner	BINARY OR DENSITY		BIPRIN	POLLY
		FREQTB	BIPRIN	POLLY
PDS-1010 Scanner	DENSITY	FREQTB	BIPRIN	POLLY
PDS-1010A Scanner	DENSITY	FREQTB	BIPRIN	POLLY
NUMONICS 1224 Digitizer	X-Y COORDINATES	HANDY	BIPRIN	POLLY

The following sequence of steps describes the workflow required to process maps using the RID*POLY system (flow charts 0.1-0.7).

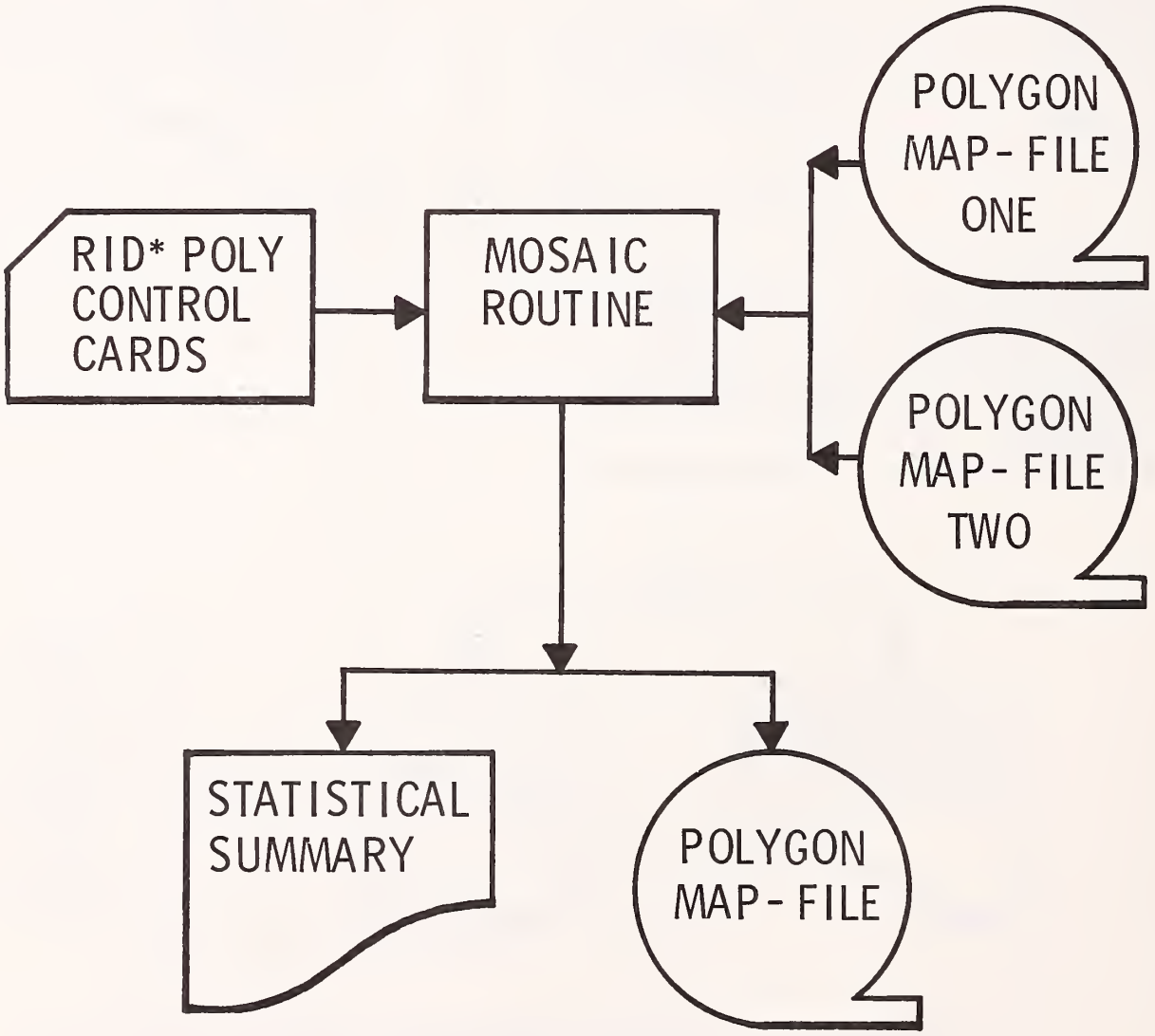
1. Record the labels (see section 5.2). Recording labels before any other work is done provides an additional close look at the maps and may uncover some remaining logical errors.
2. Produce and scan negative **or** digitize source map.
3. Convert input into a binary map-file, with BIPRIN for binary data (see section 4.2), FREQTB for density data (see section 4.1), or HANDY for digitizer data (see section 4.3).
4. Edit the binary map (see section 4.4). If the binary map requires many corrections, BIPRIN should be used to produce a permanent map containing the necessary corrections. Corrections made in a POLLY run are not recorded permanently and become expensive to process if POLLY is executed more than once per map.
5. Extract polygons from the binary map-file and produce a polygon map file with POLLY (see section 5.3). POLLY output should be edited and POLLY rerun until all error messages are eliminated (see section 5.4).
6. Once POLLY has been run without producing error messages, the polygon map-file can be processed by the following RID*POLY support programs:
   a. Plotter map can be produced with CHART (see section 6, flow chart 0.2). The plotted map can be used as an aid in editing polygon map-files or as a means of producing a final map product.
   b. Two map layers can be overlayed using the MOSAIC routine (see section 7, flow chart 0.3).
   c. Two polygon map-files can be combined using the MERGE routine (see section 8, flow chart 0.4).
   d. A polygon map-file can be updated using the TONIC routine (see section 9, flow chart 0.5).
   e. A polygon map-file can be converted into the Universal Data Exchange Format using the XCHG routine (see section 10, flow chart 0.6).
   f. A polygon map-file can be converted into a POLY*GRID file using PGRID (see section 11, flow chart 0.7).



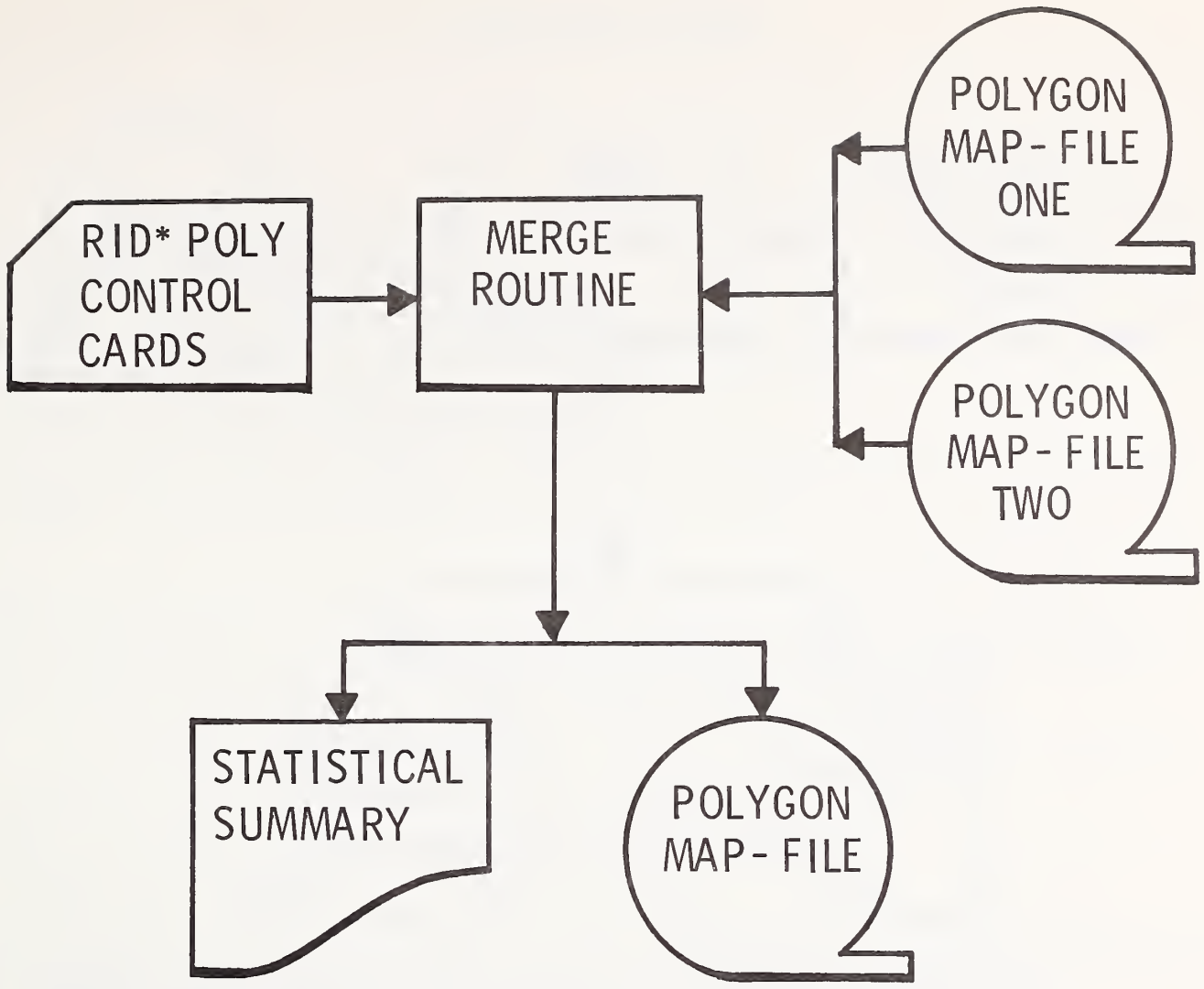
Flowchart 0.1.—Processing required to produce a polygon map-file.



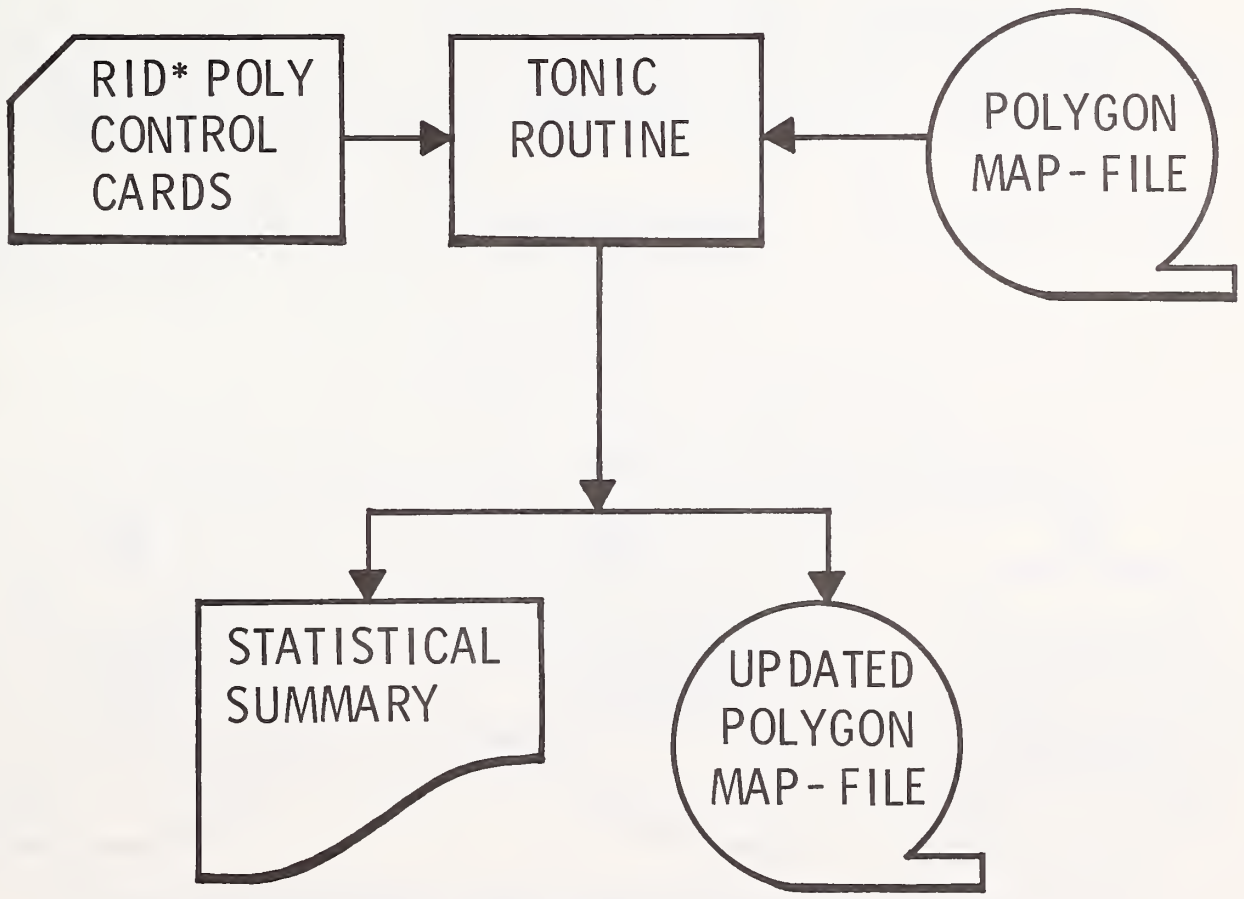
Flowchart 0.2.—Plotting a polygon map-file (CHART).



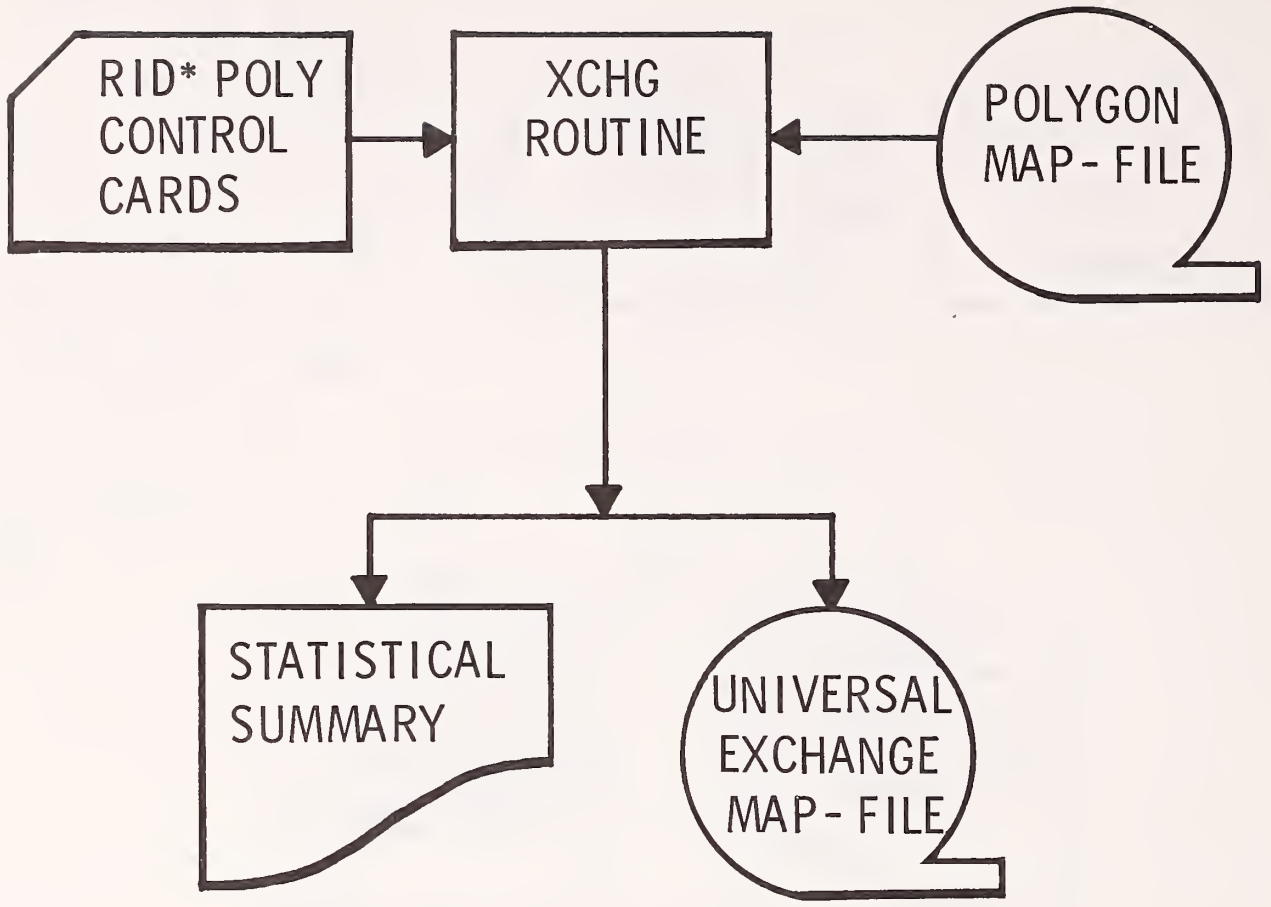
Flowchart 0.3.—Overlaying polygon map-files (MOSAIC).



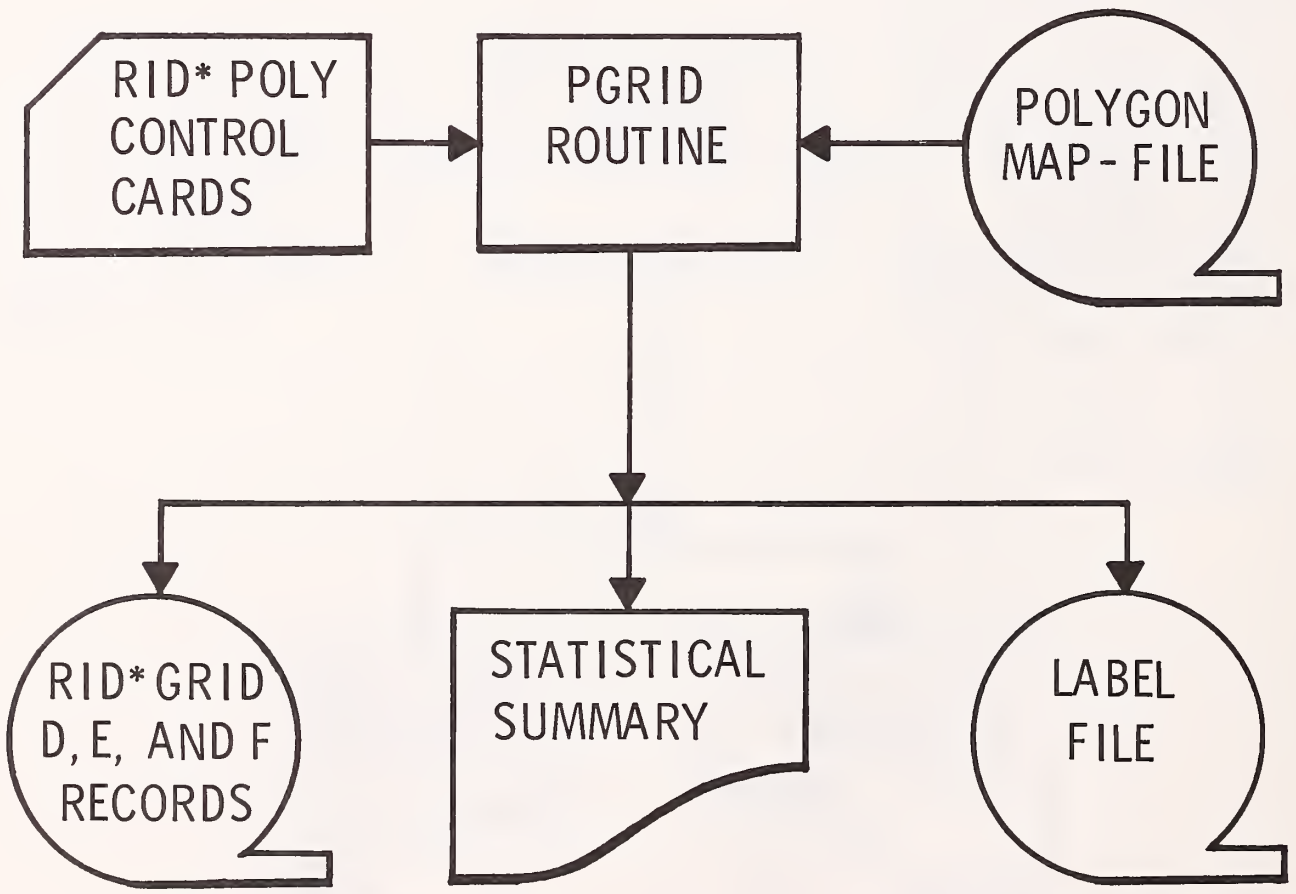
Flowchart 0.4.—Combining polygon map-files (MERGE).



Flowchart 0.5.—Updating a polygon map-file (TONIC).



Flowchart 0.6.—Producing data in the Universal Exchange Format (XCHG).



*Flowchart 0.7.—Converting RID*POLY data to RID*GRID data (PGRID).*

1. DEFINITIONS

BINARY MAP A map consisting of ones (''1'') and blanks ('' ''), ones representing polygon boundaries and blanks representing background, produced on a line printer.

BINARY MAP-FILE A binary map stored on a magnetic tape.

BIPRIN A RID*POLY program used to convert a binary or density file into a binary map-file. This program is used also to correct a binary map and produce an updated binary map-file.

CHART A RID*POLY program which plots a polygon map-file.

CONTROL CARD Eighty-column card images that contain control sections and entities. These cards instruct the RID*POLY programs to perform a specific task.

CONTROL POINTS Reference points used to orient the map sheet and the binary map to absolute geographical location.

CONTROL SECTION The syntax of RID*POLY consists of free-format entities in the form ''keyword = list''. Each entity has a predefined function. Entities that are logically related are combined into categories called control sections. Each control section consists of an identifier followed by a colon, for example, FILES:, HEADER:, OPTIONS;, etc. The control sections are described in section 2.3.2.

ENVELOPE A set of four points (minimum and maximum x and y) that delineates a rectangle encompassing a polygon (usually the perimeter polygon).

ENTITY The basic form of the RID*POLY syntax is ''keyword = list'' called an entity.

HANDY A RID*POLY program used to convert digitized data into a binary map-file.

HEADER A collection of keyword information that identifies a map-file.

ISLAND A polygon that is not attached to another polygon or the map perimeter in at least two places.

ITEM During the polygon extraction process (POLLY) a sequential number, beginning with 1, is assigned to each polygon. This number is called an ITEM number and is used to identify the polygon: ITEM 10.

KEYWORD A set of characters that the RID*POLY program recognizes as a signal to invoke a specific action.

LABEL A character string, containing 1 to 36 characters, that identifies the characteristics of a polygon.

LABEL COMPONENT A subset of a label that identifies a specific characteristic of a polygon. A label component is delineated by an ''&'', for example, STATE LAND&620&RANGE.

LAYER A characteristic or quality of a geographical area that is represented in cartographic form.

MAP A drawing of a characteristic or quality of a geographical area on a flat surface.

MAP-FILE A unit of information, stored on a magnetic tape, that describes (in a format recognizable by RID*POLY) an attribute of a geographical area: quadrangle, township, county, state, etc.

MASK A method of coding labels for selection purposes such that part of a label, part of a label component, or an entire label component can be made transparent.

MERGE A RID*POLY program that combines two polygon map-files.

MOSAIC A RID*POLY program used to overlay two polygon map-files.

OVERLAY PROCESS The procedure in which the intersections of two polygons are assembled into polygons.

PERIMETER A polygon that encompasses all polygons within a map.

PGRID A RID*POLY program that converts a polygon map-file into a RID*GRID file.

POLLY A RID*POLY program that extracts polygons from a binary map-file and produces a polygon map-file.

POLYGON A multi-sided figure that delineates an area containing homogeneous characteristics.

POLYGON MAP-FILE A polygon or group of polygons with identification stored on a magnetic tape.

POLYGON PERIMETER The x and y coordinate pairs that delineate a polygon.

SLIVER A polygon of insignificant size (area perimeter ratio less than a specified value) produced during the overlay process by polygon boundaries that almost coincide.

TONIC A RID*POLY program used to change, correct, or update a map-file.

WINDOW A rectangular subset of a map.

XCHG A RID*POLY program used to convert a polygon map-file into a format (Universal Data Exchange Format) that can be used by other information systems.

2. PROGRAM NOTES

2.1 Files

Data processed by the RID*POLY programs are stored as map-files on magnetic tapes. A map-file is a unit of information pertaining to one map. The tape on which a map-file is read or written has a name, referred to as the volume serial number. Each program requires this name to be entered on the RID*POLY control cards. For example, if the input map-file is on tape CC3930, the following card is necessary:

```
FILES: INPUT = CC3930$
```

The same convention should be followed for specifying an output map-file. Occasionally an output map-file is not required. In this case the OUTPUT file parameter should be recorded as OUTPUT = NONE; on the RID*POLY control cards.

Each map-file has a MODE attribute appearing in the header record automatically generated by the RID*POLY programs. The MODE identifies the type of data a map-FILE CONTAINS (see section 2.3.2.2).

2.2 Special Characters

Certain characters are used as delimiters in the RID*POLY syntax and should not be used in any other context. The special characters and their meanings are as follows:

' A quote mark signals the beginning or end of a comment—'this is a comment.'

: A colon delineates a control section (HEADER:) or to indicate a sequence of numbers (3:5).

= The equal sign assigns values to keywords or variables—SCALE = 31680.

〈〉 Brackets enclose repeating coordinate pairs—〈15,21:150〉.

; A semicolon terminates a keyword phrase—FOREST = ST.JOE;.

$ A dollar sign signals the end of a control section—HEADER: FOREST = ST. JOE;SCALE = 31680$.

, A comma separates arguments in a keyword list—INCLUDE ITEMS = 1,2,3:50,51$.

& The ampersand separates a label into components that can be individually accessed—620&RANGE&STATE.
(A label can have a maximum of 10 components.)

The number sign masks components of a label—INCLUDE LABELS = 620&#&STATE;.

( ) Parentheses indicate the repetition of a quantity—5(4) represents 4,4,4,4,4.

2.3 Card Formats

Card input to the RID*POLY programs consists of two types: system cards and RID*POLY control cards.

2.3.1 System Cards

System cards are dependent on the computer installation on which the RID*POLY programs are being run. The rules and examples presented in this manual are designed to operate RID*POLY on an Amdahl 470 V6 (VS2/MVS) at Washington State University, Pullman Wash.

The complete set of system cards (Job Control Language-JCL) required to execute the RID*POLY programs are stored as a member of a partitioned data set (for a listing see appendix A). Whenever a RID*POLY program is requested for execution by an EXEC card, for example,

```
// EXEC WRIS,PROG = CHART
```

the full set of system cards is automatically retrieved and the program is executed.

The system cards necessary to execute a RID*POLY program will be discussed in the following section.

1. Job card. Gives job information.

```
//Jobname JOB (accnt number,,line limit),name,MSGLEVEL = (1,1),TIME = time limit
```

Example:

```
//CHART JOB (5099xxx,,20),WALLY,MSGLEVEL = (1,1),TIME = 2
```

2. Procedure library. Data set containing the system cards (JCL) for the RID*POLY programs. See appendix A for a complete list.

```
//PROCLIB DD DSN = GINDX.Y1978.USFS.PROCLIB,DISP = SHR
```

3. Program initiation. This card selects a RID*POLY program for execution.

```
// EXEC WRIS,PROG = program name
```

where program name is one of the following:

```
FREQTB
BIPRIN
HANDY
POLLY
CHART
MOSAIC
TONIC
MERGE
XCHG
PGRID
```

The amount of memory required to execute the RID*POLY programs is given in table 2.1.

4. Input. This card signals the beginning of the RID*POLY control cards.

```
//INPUT DD *
```

Table 2.1—RID-POLY memory requirements

RID*POLY program	Core (*1024 bytes)
FREQTB	400
BIPRIN	400
HANDY	450
POLLY	520
CHART	490
MOSAIC	670
TONIC	550
MERGE	550
XCHG	420
PGRID	440

2.3.2 RID*POLY Control Sections

Information that governs the selection and processing of map information is supplied by RID*POLY control cards. Control cards are classified by section, each designed to perform a specific function.

All RID*POLY control cards are recorded in a free-field format, which means that entities do not have to appear in specified card columns. The basic building blocks of any control section are entities of the form keyword = value, where the keyword on the left is from a standard list of keywords and the value on the right can be a number, several numbers separated by commas, or a string of characters. Extra spaces can be inserted in a control card provided they are not in the middle of a number or word. When coding control cards that extend beyond column 80, continue in column 1 of the next card, as if it were one long, continuous card.

To form a complete control section: (1) enter the name of the control section followed by a colon, (2) enter one entity after another separated by semicolons, and (3) enter a dollar sign to signal an end of control section. For example:

```
HEADER: FOREST = ST.JOE;MAP = 33;LAYER = HABITAT$
```

The control sections listed below pertain to the entire RID*POLY system. Subsequent chapters of this manual indicate the control sections needed for each of the RID*POLY programs.

2.3.2.1 FILES

The FILES section is used to specify tapes that are to be used for input and output operations. Possible keywords are:

INPUT = the volume serial number of the input tape (character).

INPUT ONE = the volume serial number of the first input tape for programs that require two input map-files.

INPUT TWO = the volume serial number of the second input tape for programs that require two input map-files.

OUTPUT = the volume serial number of the output tape (character).

2.3.2.2 HEADER

A HEADER record is a collection of keyword information that pertains to a map-file. Three keywords (FOREST, MAP, and LAYER) are used to identify a map-file and must be coded correctly before an existing map-file can be accessed. Other keywords are entered or generated by the various RID*POLY programs. Whenever a map-file is processed, its current header record is printed in full. The header record is stored in the map-file at all times.

Capital letters give the "official" keywords, in the only spelling recognized by RID*POLY (only one blank should be used between words). Character strings may be any length, but they should not be any longer than necessary.

The following list contains all possible keywords that can appear in a HEADER record.

FOREST = The name of the forest. (characters)
MAP = Map number. (integer)
LAYER = Layer name. (characters)
LOCATION = Location. (characters)

SCALE = Representative fraction denominator, defined as the number of units on the ground represented by 1 unit on the map. For example, a 4-inch-per-mile map has a representative fraction of 1/15840 and should be coded SCALE = 15840;. (integer)

GEOGRAPHIC CONTROL POINTS = Latitude and longitude of each control point, latitude preceding longitude for each point. These points can be entered in degrees, minutes, and seconds (separated by colons) or their decimal equivalents. Do not omit zeroes. In the seconds position, you can record to the nearest hundredth second using a decimal point. An accuracy of at least 0.5 second is essential. The maximum meaningful accuracy is 0.01 second. For example, GEOGRAPHICAL CONTROL POINTS = 47:45:15.05, 115:45:15.1, 47:45:15, 115:30:00.02;

MAP CONTROL POINTS = x and y coordinates of the control points, in units of 0.01 inch on the map (MAP CONTROL POINTS = 100,100,100,1202,1905,1202,1905,100;). (integers)

GRID CONTROL POINTS = Row and column coordinates from the binary map which correspond to the selected MAP CONTROL POINTS (GRID CONTROL POINTS = 1160,7,5,120,5,1400,1160,1409;). (integers)

SCAN ROWS = Number of rows on binary map. (integer)
SCAN COLUMNS = Number of columns on binary map. (integer)
MODE = n. Identifies the type of map-file where n is an integer representing:

−1 = scandig density map-file.

0 = scandig binary map-file.

1 = binary map-file.

2 = polygon map-file with a perimeter polygon (POLLY).

3 = polygon map-file without a perimeter polygon (MOSAIC).

ENVELOPE = Overall envelope of all polygons on the map, namely, the smallest x, smallest y, largest x, and largest y. Same units as map control points. These values are calculated by the system. (integers)
DATE WRITTEN = The date the map-file was written.
TIME WRITTEN = The time the map-file was written.
REEL NUMBER = Tells what reel number the map-file is on.
POSITION ON REEL = Indicates the map-file position on the reel. (integer value)
ZONE = Zone number of map in the State plane coordinate system.
STATE = Name of State for State plane coordinate system.

2.3.2.3 HEADER UPDATES

This section allows for modification of information in the header record; existing items can be updated or new items can be added. The keywords described in the previous section (2.3.2.2) are the same for this section.

Example:

```
HEADER UPDATES: MAP = 30; LAYER = HAUGAN QUAD$
```

2.3.2.4 OPTIONS

This section allows certain program options to be selected. Refer to the appropriate chapter (BIPRIN, POLLY, CHART, etc.) for specific information.

2.3.2.5 CORRECTIONS

This section is used by BIPRIN or POLLY to make corrections in a binary map. Items are:
ADDS = list of x-y coordinate pairs, where "one" bits are to be inserted on a binary map.
DELETES = List of x-y coordinate pairs indicating locations on a binary map where "one" bits are to be removed. Guidelines for coding corrections are listed in chapter 4.

2.3.2.6 LABELS

This section is used by the POLLY program to attach labels to polygons during the polygon extraction process (see chapter 5). The first card of this section must be:

```
LABELS: LIST =
```

The list of labels must start on the following card. See chapter 5 for more information on recording polygon labels.

2.3.2.7 PLOT OPTIONS

This section is used in the CHART program to select various plot options (see chapter 6).

2.3.2.8 MOSAIC OPTIONS

The section is used to specify options for the overlay procedure; see chapter 7 for further information.

2.3.2.9 POLYGON SELECTIONS

A subset of the polygons in a map-file can be selected for processing by a program. The selection is made by specifying polygons to include or exclude. The specifications involve six variables: item number, type, label, area, perimeter, and envelope. Any combination of the six may be used except item number, which must be used alone. A combination may involve both inclusions and exclusions but not on the same variable. When a combination is used, a polygon must meet all of the criteria given in order to be selected.

Entities are punched on cards in the standard format ''keyword = list''.

The keywords are:

1. INCLUDE ITEMS = list of item numbers;
   or
   EXCLUDE ITEMS = list of item numbers;

This option is used to select a subset of polygons from a polygon map-file by explicitly identifying polygons to be included or excluded by their item numbers. For example,

```
POLYGON SELECTIONS: INCLUDE ITEMS = 1,10,50,75:80$
```

will select a subset of polygons containing items 1,10,50,75,76,77,78,79,80. The maximum number of items that can be included or excluded is 2047.

This option cannot be used with any other options under this section.

2. INCLUDE TYPES = list of type numbers;
   or
   EXCLUDE TYPES = list of type numbers;

This option is used to select points (TYPE = 1), lines (TYPE = 2), or polygons (TYPE = 3). As of the date this manual was written, RID*POLY was designed to process only polygon data.

3. INCLUDE LABELS = label list;
   or
   EXCLUDE LABELS = label list;

This option is used to select a subset of polygons by specifying labels or label components. If polygons are to be selected by labels, then the label list should contain the desired labels. If polygons are to be selected by label components then the ''#'' (number sign) should be used to mask unwanted components of a label. For example,

```
POLYGON SELECTIONS: INCLUDE LABELS = STATE#&620&#$
```

will select a subset of polygons which has labels such that: (1) component one begins with the characters STATE, (2) component two contains only the characters 620, and (3) component three contains any characters.

4. INCLUDE AREAS GREATER THAN = x;
   and/or
   EXCLUDE AREAS GREATER THAN = x;

This option is used to select a subset of polygons based on their size. The variable x is a floating point number representing acres. For example,

POLYGON SELECTIONS: EXCLUDE AREAS GREATER THAN = 1000.0$

will select a subset of polygons which has areas of 1,000 acres or less.

5. INCLUDE PERIMETERS GREATER THAN = x;
   and/or
   EXCLUDE PERIMETERS GREATER THAN = x;

This option is used to select a subset of polygons based on the length of their perimeter (boundaries). The variable x is a floating point number representing feet. For example,

POLYGON SELECTIONS: INCLUDE PERIMETERS GREATER THAN = 2050.0$

will select a subset of polygons that has perimeter lengths greater than 2,050 feet.

6. INCLUDE RECTANGLE = min x, max x, min y, max y;

This option is used to select a subset of polygons that are contained completely within a specified rectangle (window). The min and max values are integer numbers (in units of 0.01 inch) representing map coordinates. For example,

POLYGON SELECTIONS: INCLUDE RECTANGLE = 100,800,500,1000$

will select a subset of polygons that has only x coordinates between 100 and 800 and y coordinates between 500 and 1,000.

2.3.2.10 END$

This section is used to signal the end of control sections for the map currently being processed. If multiple maps are to be processed in a single run, the END$ section should be entered as the last control section for each map.

2.4 Integer Lists

Many programs will require a list of integers, whole numbers without decimal points, as input from cards at some point (some header record keywords are in this form). Rather than require a fixed field size and card location for each number, we use a free format. The integers are punched in as many columns as are needed. Successive integers are separated by commas. The list is terminated by either a semicolon or a dollar sign, depending on context. Information can be continued on the next card as if it were one long card. However, to facilitate future changes, information should not be spanned across cards. Blanks (skipped columns) can be inserted anywhere except between the digits of a number.

Three abbreviations are possible: (a) A sequence of increasing or decreasing numbers such as ''6, 7. 8, 9'' can be shortened to ''6:9''. (b) A repetition of the same numbers, such as ''4,4,4,4,4'' can be abbreviated ''5(4)''. A combination is possible, such as ''2(5,7:9)'', which is the same as ''5,7,8,9,5,7,8,9''. In other words, whatever is inside the parentheses is repeated as many times as the number in front indicates. (c) For ease in recording sequences of coordinate pairs, we allow the special forms ⟨x,a:b⟩ and ⟨a:b,y⟩. The lower case letters stand for integers. For example, ''⟨31,617:653⟩'' is the same as ''31,617,31,618,...,31,653''.

2.5 Comments

Comments can be included anywhere in the RID*POLY cards by enclosing the comment material in quote marks. A comment is information that you do not want the RID*POLY programs to read. Whenever a program encounters a quote mark in the input stream, it scans forward until the matching quote mark is found and resumes processing at that point.

2.6 Printout

Certain information occurs on almost every printout and may need some explanation. All RID*POLY control cards are printed with the label, INPUT CARD. This helps you check your work in case of error. Every page printed by a RID*POLY program is headed by the program name, the date, time of day, and a page number. The message END OF RUN is printed at the end. Most of the input information is printed back as cards, showing you how the data have been supplied to the computer. This helps you spot errors. Whenever there is an output map-file, the message OUTPUT FILE WRITTEN will be printed after the writing is complete. You need this message to be sure the map-file can be read as input in a future run.

2.7 Limitations

The maximum number of polygons that can be selected in the POLYGON SELECTIONS section is 3,000.

The maximum number of labels that can be selected in the POLYGON SELECTIONS section is 250.

The maximum number of points in a polygon perimeter is 1,991.

The maximum number of polygons in a map-file is 5,000.

The maximum number of polygons in an overlay map-file is 5,000 minus the number of polygons selected from each input polygon map-file.

The maximum number of characters in a label is 36.

The maximum number of label components is 10.

3. PREPARING MAPS

Proper map preparation is the most important step in the digitizing process. Avoiding errors here has a greater impact on cost than at any other stage. Two sources of errors can be eliminated: poor ink quality and logical map errors.

3.1 Automatic Scanning

Maps can be drafted at any scale such that after an 8x to 11x reduction a photographic negative of the map can be obtained to fit the scanning bed or drum of a microdensitometer (maximum of 9 inches by 9 inches for SCANDIG). Line width on the map sheet should not be wider than the narrowest gap betweeen lines. (A line width of 0.5 mm, size of a #2 Rapidograph pen, on a 610 mm by 610 mm map has proved satisfactory for most applications.) The aperture setting (size of spot measured) on the scanner should be half the width of the lines on the negative.

Ink lines should be of uniform width and uniform density. Moving the pen too rapidly along a straight edge when inking straight boundaries produces a thin, weak line. A good quality inking job can eliminate corrections in later stages.

At this stage, common errors are failure to label a polygon or double labeling of a polygon. A polygon may be double labeled because it looks like two polygons or because the line separating two polygons is not inked.

Maps to be digitized with a scanner must be specially prepared. With a #2 Rapidograph pen, draw in black ink the polygons to be digitized. Polygons must not overlap and should fill the area to be digitized. Labels or other map features, if entered on the map sheet, should be written with a photo-transparent blue pigment pencil (EAGLE Verithin nonphoto blue 740 1/2) and thus will not appear on the photographic negative. Only one layer of information (attribute) should be entered per map sheet, for example, timber type, management constraints, or administrative boundaries. To completely fill an area with polygons, assign a special label to all areas that are not of interest. This step is critical for finding all errors during the editing process. The map must also be free of islands (fig. 3.1). Remove islands by connecting them to the ''mainland'' in two separate places (fig. 3.2). Eliminating islands creates new polygons that must be labeled with the same label as the polygon they were split from. The new polygons should be large enough for a label to fit inside.

Complexity does not affect the computer time required to process an automatically-scanned map. The number of density readings that must be taken on a simple map are the same as on a ''busy'' one. On a simple map, however, nearly all readings are zeros. Therefore, a simple map is relatively expensive to process by the scanner method, considering the small amount of information collected.

3.2 Manual Digitizing

Another method of inputting data to the RID*POLY system is to manually digitize the polygon boundaries. This method utilizes a hand-guided digitizer and a program (HANDY) that processes its output into the same form produced by FREQTB or BIPRIN. Because of its limitations, this method is an alternative rather than primary method. Users should choose the scale and area of their maps in such a way that most of the work can be efficiently processed by the scanning method, leaving only a small part to be hand digitized.

No special preparation of maps is needed for the hand digitizing process, but logical errors must be avoided. Tape the map to the digitizer surface. Move the cursor over all lines that are to be recorded. A boundary may be recorded in as many pieces (records) as necessary as long as no gap is left between pieces. A small overlap of x-y coordinate pairs is desirable at the end of polygon boundaries and T-shaped intersections. Point mode, recording only the end points, should be used for straight lines. (Point and line mode are interchangeable.)

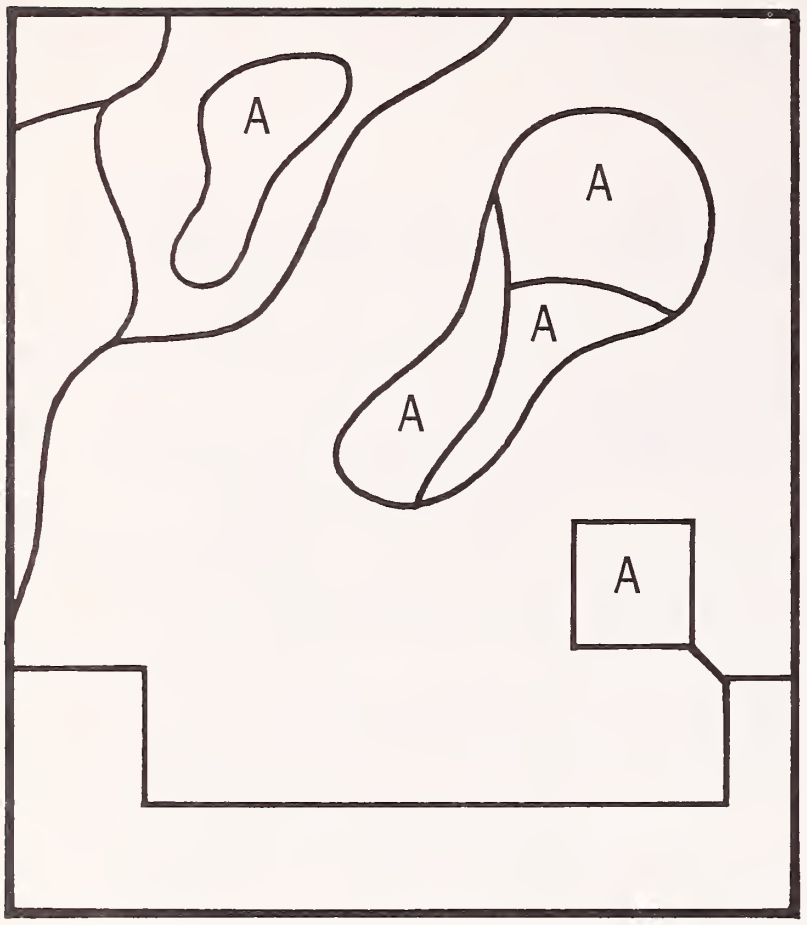


Figure 3.1.—Polygon Islands.

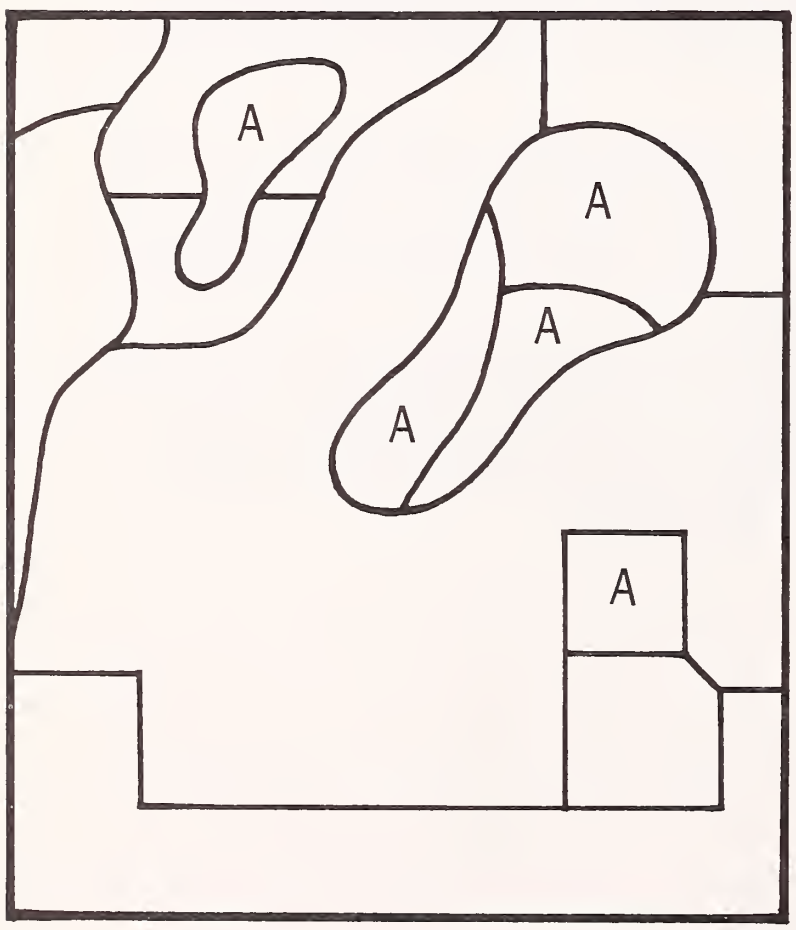


Figure 3.2.—Islands connected.

4. PROCESSING INPUT DATA

4.1 Processing Density Data (FREQTB)

FREQTB reads density tapes produced by automatic scanners, which record image density on a scale from 0 to 63 (using the six high-order bits of each density reading). The program tabulates the frequency distribution of the densities and produces a binary tape. FREQTB computes a threshold by subtracting the DENSITY ADJUSTMENT FACTOR from the mode of the density frequency table. Each six-bit value is converted to a one, if below, or to a blank, if above, the established density threshold. The resulting matrix of binary values (binary map) duplicates the scanned negative, with ones representing lines (low density) and blanks representing the background (high density). The one/blank values are written compactly on tape for use by BIPRIN or POLLY. Printed output is a binary map in which polygon boundaries are delineated by ones.

There are three versions of FREQTB: FREQ1 is designed to process density readings from a PDS-1010A scanner (Perkin-Elmer Corportion, South Pasadena, Calif.); FREQ2 is designed to process density readings from a PDS-1010 (old Berkeley scanner); and FREQ3 is designed to process density readings from a SCANDIG scanner.

The FREQTB routines are not used very often because it is more efficient to produce a binary file and process it through BIPRIN. FREQTB should be used only for scanners that cannot produce a binary file. The IBM FREQTB routines simply convert density map-files to BINARY map-files, thus, they do not follow the RID*POLY program conventions.

Input cards:

1. System control cards (required). See appendix A.

```
//(JOB CARD)
/*TO USFS
//PROCLIB DD DSN = GINDX.Y1978.USFS.PROCLIB,DISP = SHR
// EXEC PROG = FREQTB,INTAPE = nnnnnn,INLAB = n,OUTAPE = mmmmmm,OUTLAB = m
//FREQTB.INPUT DD *
```

where:

nnnnnn represents the volume serial number of the tape that is to be used as input.

n represents the file number to read from above input tape.

mmmmmm represents the output tape on which the binary map-file is to be written.

m represents the file number to write on the output tape.

(For further information on FREQTB procedures see appendix A and for system cards see section 2.3.1.)

2. RID*POLY control cards
   a. xxyy (required)

      xx - 2 digit number which specifies the number of maps to process in the current run.

      yy - DENSITY ADJUSTMENT FACTOR. Integer number between 0-63 used to specify the cutoff level between ones and blanks (background) on a binary map. If left blank, cutoff will be calculated.

   b. Header record. (required)
      One card containing FOREST,LAYER,MAP,LOCATION, and MODE = 1

Sample Input Deck:

```
//FREQTB JOB (acc.no.,,30),NAME,MSGLEVEL = (1,1),TIME = 2
//PROCLIB DD DSN = GINDX.Y1978.USFS.PROCLIB,DISP = SHR
// EXEC PROG = FREQTB,INTAPE = CC3930,INLAB = 3,OUTAPE = CC4530,OUTLAB = 1
//FREQTB.INPUT DD *
01
FOREST = ST.JOE; MAP = 33; LAYER = HABITAT; LOCATION = HAUGAN; MODE = 1$
//
```

4.2 Processing Binary Data (BIPRIN)

BIPRIN reads a binary tape (from the SCANDIG scanner, the FREQTB program, or a previous BIPRIN run), applies any corrections or updates (see section 4.4, Editing a Binary Map), prints selected parts of the resulting binary map, and writes a corrected binary map-file on tape (if directed). BIPRIN is very useful for editing maps which require many corrections, because (unlike POLLY) the edited binary map-file may be kept.

Input Cards:

1. System cards. (required)

```
//WRISRUN JOB (acc#,,30),name,MSGLEVEL = (1,1),TIME = 2
//PROCLIB DD DSN = GINDX.Y1978.USFS.PROCLIB,DISP = SHR
// EXEC WRIS,PROG = BIPRIN
//INPUT DD *
```

2. RID*POLY control cards. (see section 2.3 for exact formats)

a. FILES: (required)

The FILES section identifies the tape reels that are to be used for input and output. An input tape is required and must have the volume serial number specified. The output tape is not necessary unless changes to the binary map or the header record produce an output map-file that is to be saved. If an output file is specified, then it must specify the volume serial number of the tape used for output.

b. HEADER: (required)

The HEADER section is used to select a binary map-file for processing (see section 2.3.2.2 for further information). MAP, FOREST, and LAYER are required to locate the correct input map-file. They must be specified exactly as they were entered in the HEADER record on the scanner output file.

c. HEADER UPDATES (optional)

This section is used to add information to the header record or to correct it.

d. OPTIONS: (optional)

This section is used to select various features of the BIPRIN routine. Available options are:

SKIPS = n; causes the input tape to be positioned forward over n map-files. This option is particularly useful when the same identifier has been used accidentally in two or more map-files on the input tape.

PRINT = CORNERS/ALL/NONE; indicates the print output desired for a binary map.

An alternate method of specifying map areas to be printed is:

```
ROWS = n1, n2, n3, n4;
COLUMNS = m1, m2, m3, m4;
```

This example would result in two map areas being printed. The first area is bounded by rows n1 and n2 and columns m1 and m2. The second area is bounded by rows n3 and n4 and columns m3 and m4. Up to 4 areas can be specified for each map. If only ROWS are specified, a strip the width of the map will be printed, as the COLUMNS values default to the first and last column values of the map. Similarly, if only COLUMNS are specified, the ROWS values default to the first and last map row values.

PRINT = and ROWS = ,COLUMNS = are mutually exclusive.

FLIP = SIDE/UP; is used to reverse a binary map from side to side *or* top to bottom. No reversal is done if FLIP is not in the OPTIONS section.

THIN/NOT THIN; indicates whether the lines on the binary map are to be thinned.

LEAVE ENDS/TAKE ENDS indicates whether to remove ends of lines during the thinning process. TAKE ENDS should be used cautiously, as a gap in a needed line may be widened. An example of a use for TAKE ENDS is to eliminate unintentional stray marks that show up on the binary map. TAKE ENDS is useless unless the THIN OPTION is in effect.

ITERATIONS = n; places a limit on the number of passes the line-thinning routine makes over the binary map. Very sloppy ink work on the original map may require five or more iterations. This option is useless unless the THIN option is in effect.

SWAPXY; used to switch the x-y coordinate values in the corrections section. The x-y values are switched from column-row to row-column form. For example, 90,1500 would be switched to 1500,90.

Options can be in any order within the OPTIONS section.

The following list indicates default values for BIPRIN:

Option	BIPRIN default
SKIPS	0
PRINT	ALL
FLIP	Not flipped
THIN/NOT THIN	NOT THIN
LEAVE ENDS/TAKE ENDS	LEAVE ENDS
ITERATIONS	5
SWAPXY	row-column

e. CORRECTIONS: (optional)

This section is used to make corrections on a binary map. For further information on correcting a binary map see section 4.4.

Sample Input Deck:

```
//JOB (,,35),BIPRIN,MSGLEVEL = (1,1),TIME = 2
//PROCLIB DD DSN = GINDX.Y1978.USFS,PROCLIB,DISP = SHR
// EXEC WRIS,PROG = BIPRIN
//INPUT DD *
FILES: INPUT = WRIS01; OUTPUT = NONE$
HEADER: FOREST = ST.JOE:LAYER = TENSED HAB.;MAP = 2017$
HEADER UPDATES: FOREST = ST.JOE;LAYER = HABITAT;MAP = 59;
LOCATION = TENSED$
OPTIONS: NUMBER OF MAPS = 1; PRINT CORNERS; THIN; ITERATIONS = 3$
```

See appendix F.1 for the actual execution of this job stream.

4.3 Processing Digitizer Data (HANDY)

The HANDY program receives as input, data written by a digitizer. Output is a tape that appears the same as the output of FREQTB; a map scanned on a grid having a spacing of 0.02 inch. HANDY constructs a grid of that spacing, presets all of its points to the value 0, and then changes to 1 all points that a digitized line passes over. Thus, overlapped segments are merely redundant. Any spur-like overruns are pared off during later processing.

Input cards:

1. System control cards (required). See appendix A.

```
//(JOB CARD)
//PROCLIB DD DSN = GINDX.Y1978.USFS.PROCLIB,DISP = SHR
// EXEC WRIS,PROG = HANDY
//INPUT DD *
```

2. RID*POLY control cards. (See section 2.3 for more information)
   a. FILES: (required)
      This section is used to identify the input and output tapes.
   b. HEADER: (required)
      This section is used to build a HEADER record for the binary output map-file.
   c. OPTIONS: (optional)
      SKIP = n$ causes the input tape to be positioned forward over n files.

Sample Input Deck:

```
//JOB (,,35),HANDY,MSGLEVEL = (1,1),TIME = 2
//PROCLIB DD DSN = GINDX.Y1978.USFS.PROCLIB,DISP = SHR
// EXEC WRIS,PROG = HANDY
//INPUT DD *
FILES: INPUT = WRIS01; OUTPUT = NONE$
HEADER: FOREST = ST.JOE;LAYER = LAND USE;MAP = 100;
LOCATION = BUZZARD ROOST$
OPTIONS: SKIPS = 1$
```

See appendix F.3 for the actual execution of this job stream.

4.4 Editing a Binary Map

Most binary maps will not require extensive editing if spacing, aperture, and "threshold adjustment" of the microdensitometer have been properly selected and if good quality maps were scanned. For these maps the PRINT = CORNERS option in BIPRIN is all that is needed to get the GRID CONTROL POINTS (see section 5.1). A square or rectangular map of good quality will not require a BIPRIN run if the corners are the four control points, because POLLY automatically finds the corner points and uses them as GRID CONTROL POINTS.

4.4.1 Editing Guidelines

The general procedure is to mark all errors on the computer printout (binary map). Next, record all corrections on data forms for keypunching. The printout is a series of vertical strips, commencing with the left-most edge of the map.

Visually scan each strip, comparing it with the map or a photo of the map for errors. Careful editing of the printout at this stage will save considerable time and cost later. Correct each error by circling with a red pencil each "1" to be deleted and circling with a blue or green pencil each space where a "1" is to be added. Put a check in the right margin if one or more corrections occur in a row. These checks will help to avoid omissions at the data recording stage. Blocks of 10 lines are not printed if they are blank.

Follow these rules for adding or deleting 1's:

1. Fill in gaps in lines with as few points as possible (fig. 4.1).
2. Open the gaps between close lying lines (fig. 4.2).

Hints for editing:

1. Construct ''rulers'' consisting of the column heads for each strip. Insert rulers in the printout at the beginning of each strip. This helps to minimize the error of forgetting to change rulers at the beginning of each strip. Row numbers are printed along the right side of the strip. The strip number is printed in a column to the right of the row number.

2. Inspect each string of 1's for gaps in lines, small polygons, and areas with a high density of 1's. The gaps are potential areas for corrections. Two 1's are considered connected if they are in adjacent spaces either vertically, horizontally, or diagonally. Look particularly for polygons with only a few interior cells. Such polygons are hard to spot when they are formed by diagonal connections. Two kinds of features that can cause extra small polygons are acute corners of a boundary with a small interior angle and two parallel boundaries that are close together on the map but not separate on the printout.

3. Because each addition and deletion must be recorded and keypunched, corrections should be kept to a minimum.

4. Two polygons connected by a narrow neck on the map may have two different labels. Therefore, take care when correcting this kind of gap.

5. The first two columns on each strip are repeats of the last two columns of the previous strip. These columns almost eliminate the need to refer to previous strips while making corrections. Any correction to a repeated column need only be made once.

6. Ignore stray 1's that result from photographing portions of labels or specks of dirt. The POLLY program will ignore them. The polygon also ignores any piece of a line that is not part of a loop. This is proper if the line was produced by a smudge but will result in an error if it is due to a gap in an inked line.

7. The printout should be edited twice, each time by a different person. Usually, additional omissions will be found and the list will lengthen.

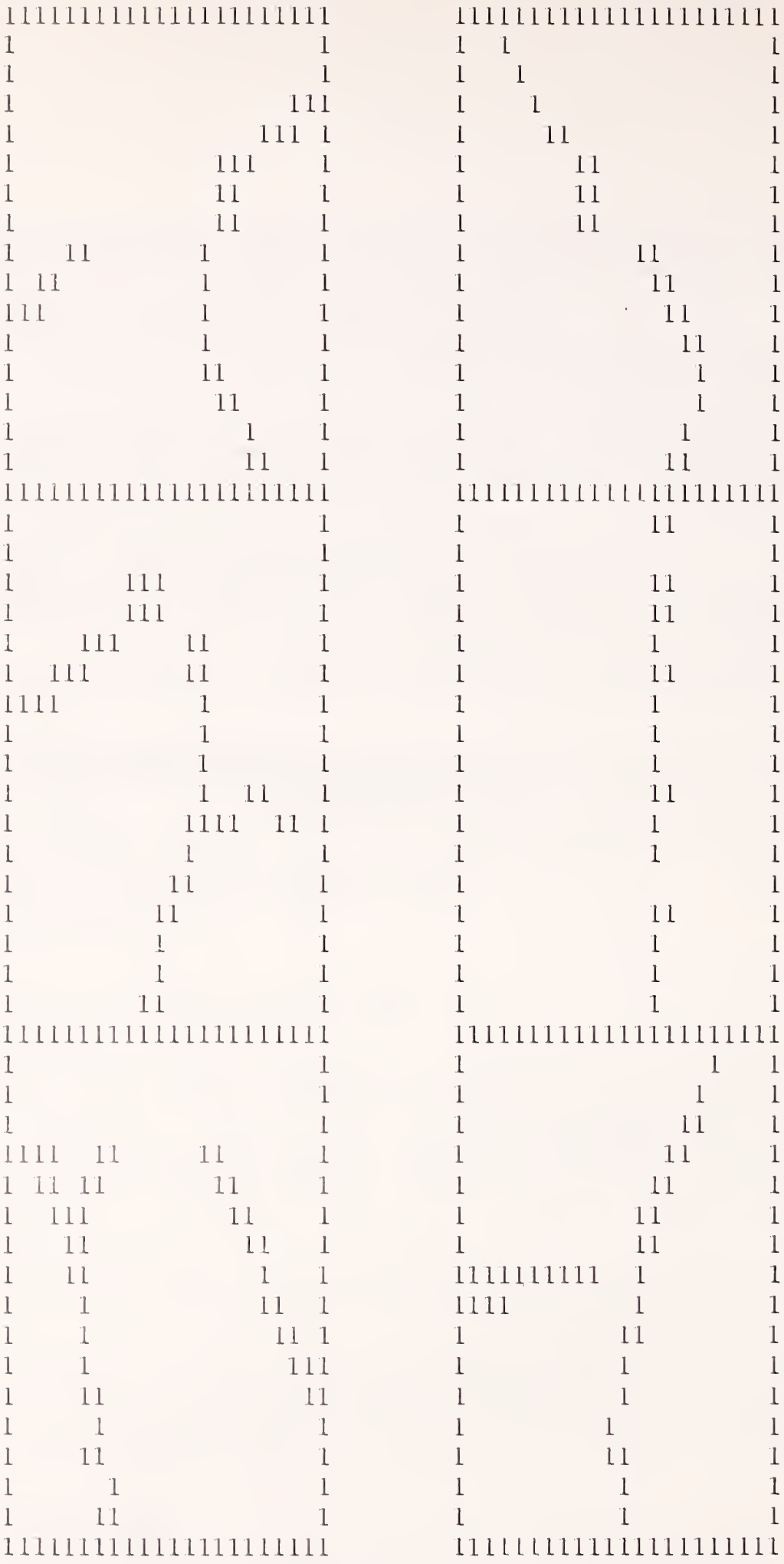


Figure 4.1.—Example of lines needing ADDS.

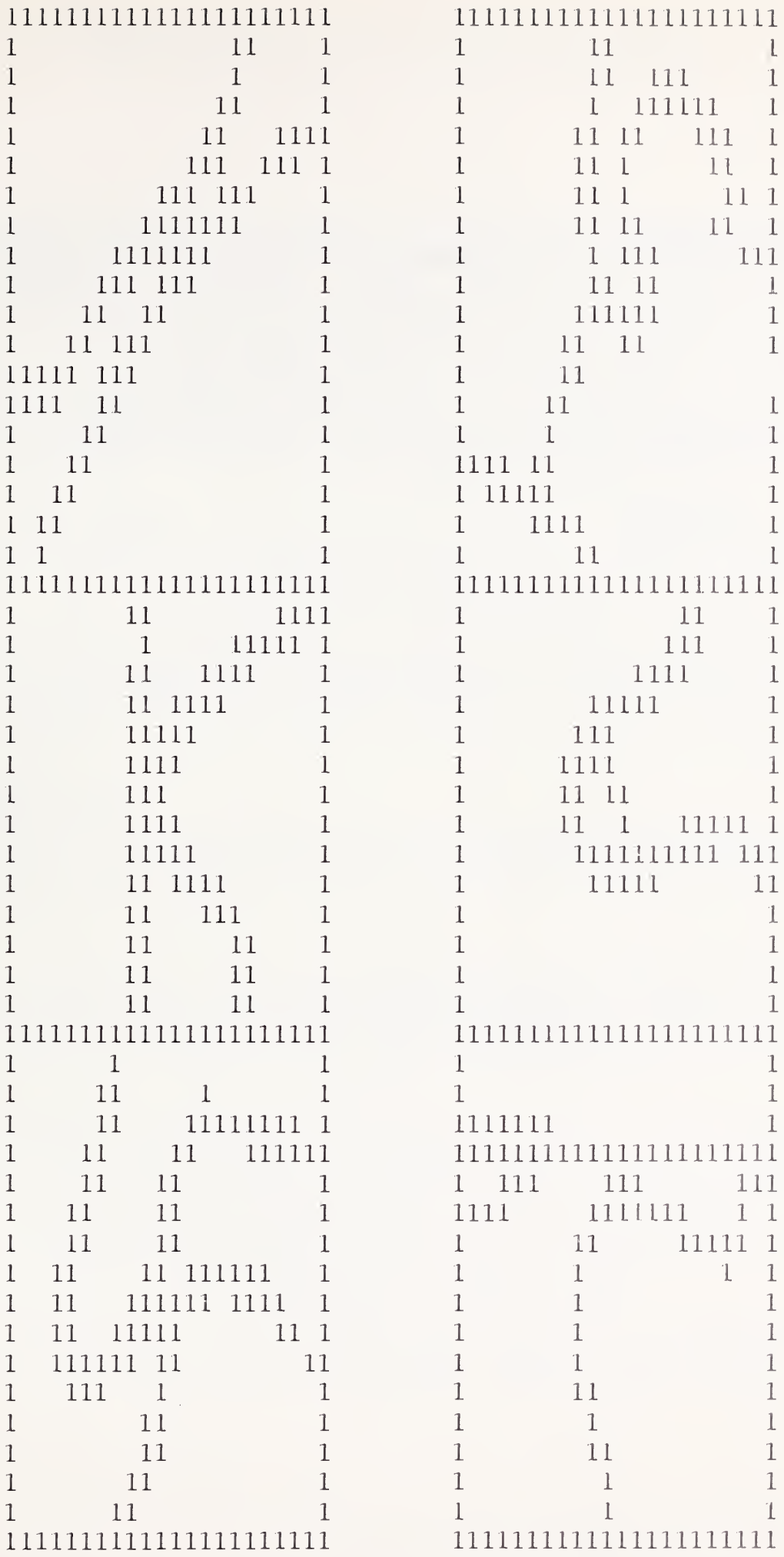


Figure 4.2.—Example of lines needing DELETES.

4.4.2 Recording Error Corrections

Next record the "add" and "delete" corrections marked on the FREQTB, BIPRIN or HANDY printout. Start the recording with a card that identifies the adds and deletes: ADDS = or DELETES =. It is helpful to start recording deletes at the top of a separate sheet. Each strip has a ruler for recording column numbers. Look for checkmarks in the right margin opposite rows needing correction. Record adds and deletes by row and column on data forms; examples, 5,62,10,453. For convenience in subsequent editing, start each line with a row entry and end with a column entry followed by a comma. Leave unused columns blank. In this way an item will not be split between lines, and no error will occur if the order of the cards is changed. Long consecutive lists of items in one row or one column may be added or deleted by the following shortcut method:

⟨R,C1:C2⟩, or ⟨R1:R2,C⟩

For more information on the shortcut form of recording integer numbers, see section 2.4.

5. PRODUCING A POLYGON MAP-FILE

Once a map has been digitized and condensed to binary form, it is necessary to generate a file of polygons from it and to label them. The POLLY program is used to perform this task. This section will describe the steps necessary to set up a POLLY run and edit the output.

5.1 Control Points

Control points are reference points that are used to align the binary map, source map, and absolute geographic location. Control points must be recorded in three coordinate systems:

GRID CONTROL POINTS are the row and column positions of the control points in the grid coordinate system of the binary map, for example 1100,20.

MAP CONTROL POINTS are the x-y coordinates in hundredths of inches used to locate the labels within their respective polygons, for example, 100,100.

GEOGRAPHIC CONTROL POINTS are the latitude and longitude of the control points, for example, 47:30:15.5,115:15:30.20.

Quadrangle corners are usually selected as control points, although any other sharply defined locations will do. These are recorded in a clockwise manner, starting in the lower left corner. Four corners are the most desirable, but three (or even two) may be sufficient. The corner must be a recognizable point on or within the map boundary, not some arbitrary point on the map sheet. All maps representing the same geographic area should use the same control points to represent ground locations.

5.2 Recording Polygon Labels

A label is a string of 1 to 36 characters that identifies the attributes of a polygon. In order to extract polygons from the binary map, all polygons must be assigned a label and an x-y coordinate to position the label within the polygon.

5.2.1 Setup

To record the x-y position of the labels, an axis must be established. The length of each axis must exceed the largest map dimension expected. The vertical or ''north-south'' direction is designed as the y axis. The map must be positioned within the right angle (first quadrant) formed by the x-y axis so that all points on the map are positive, nonzero integers. The x and y distances are recorded from the origin in hundredths of an inch.

5.2.2 Label Recording

Start recording labels and their x-y positions on a new line of the data form. Select a coordinate position that is centrally located in the polygon. Use a photo transparent pencil (sky blue, Eagle 740-1/2 currently available in GSA catalog) to check off each label as it is recorded. An entity consists of a label followed by its x and y position. Entities are separated by a comma. The last entity is followed by a dollar sign. Within the entity, the three parts are separated by one or more blanks. The x and the y coordinates are in units of 0.01 inch. Thus, 24 inches from the origin is written as 2400. For example, FOREST 900 1100, RANGE 300 420, FOREST 590 1000;

These data are written as one long ''stream;'' the end of a line on a data form has no significance. If an entity is not complete when the last column is reached, it can be continued on the next line. However, it is recommended that an entity be entered on one line and not spanned across lines. This practice will facilitate future changes.

5.3 Extracting Polygons from a Binary Map-File (POLLY)

The POLLY program extracts polygons from the binary map-file by using the label locations as starting points (see section 5.2.2). Corrections to a binary map-file may also be made in POLLY by using ADDS or DELETES. All the polygons extracted are written on the output tape. POLLY will run a batch of jobs when there is a series of control cards.

Input Cards:

1. System cards. (required)

```
//(JOB CARD)
//PROCLIB DD DSN = GINDX.Y1978.USFS.PROCLIB,DISP = SHR
// EXEC WRIS,PROG = POLLY
//INPUT DD *
```

2. RID*POLY control cards.

a. FILES: (required) contains input and output tape volume serial numbers.

b. HEADER: (required) contains forest, map, layer, geographic control points, map control points, grid control points, location, scale, state, and zone.

c. HEADER UPDATES: (optional) contains any changes in the input header record which should be on the output tape.

d. OPTIONS: (optional)

SKIPS = n; causes the input file to be positioned forward over n map-files.

SWAPXY; is used to switch the x-y coordinate values in the CORRECTIONS section. The x-y values are switched from column-row to row-column form. For example, 90,1500 would be switched to 1500,90. The default is row-column form.

CHECK HOLES; This option causes the POLLY program to check the binary map for holes (small areas caused by line intersections) and unlabeled polygons. However, the hole-checking routine will not be executed unless all input labels have been successfully extracted and the area of the enclosing polygon (perimeter polygon) exceeds the area of the enclosed polygon by 1 part in 4000. Default is not to check holes.

PRINT ACREAGES; This option will produce a table of acreage figures for the polygons extracted in the current POLLY run.

e. CORRECTIONS: (optional) contains ADDS and DELETES if any.

f. LABELS: (optional) Contains the labels with their x-y locations in map coordinates. If no labels are provided, POLLY uses the upper left-hand corner of each polygon as a label location and assigns the label NEEDS LABEL to each polygon. If this section is included, the first card must be:

```
LABELS: LIST =
```

The labels must start on the next card.

g. END$ (required for multiple runs): This section is used to signal the end of RID*POLY control sections for the map currently being processed. This section is required if more than one map is to be processed in a single run.

Sample Input Deck:

```
//JOB (,,100),'POLLY TEST',MSGLEVEL = (1,1),TIME = 5
//PROCLIB DD DSN = GINDX.Y1978.USFS.PROCLIB.DISP = SHR
//EXEC WRIS,PROG = POLLY
//INPUT DD *
FILES: INPUT = WRIS01; OUTPUT = NONE$
HEADER: FOREST = ST.JOE; MAP = 59; LAYER = HABITAT$
OPTIONS: SKIPS = 2$
HEADER UPDATES: FOREST = ST.JOE; MAP = 59; LAYER = HABITAT;
LOCATION = TENSED;
'TENSED HABITAT ST.JOE'
MAP = 059; FOREST = ST.JOE; LAYER = HABITAT; LOCATION = TENSED;
MAP CONTROL POINTS =  101,117,102,1857,2460,1831,2463,101;
GEOGRAPHIC CONTROL POINTS = 47:00:00,117:00:00,47:07:30,117:00:00,47:07:30,116:45:00,47:00:00,116:45:00;
GRID CONTROL POINTS = 39,33,25,876,1164,892,1180,54;
STATE = IDAHO; ZONE = 3; SCALE = 31680; ENVELOPE = 98,98,1850,2465$
CORRECTIONS:
ADDS =
⟨1114,116:118⟩,⟨32,442:444⟩,⟨1172,458:466⟩,⟨1174,404:407⟩,
⟨39,81:83⟩,⟨680:691,44⟩,679,45,⟨680:684,46⟩,⟨1178,157:158⟩,
1179,152,911,345,⟨35,286:291⟩,912,344,302,604,301,605,300,606,
⟨298:299,607⟩,⟨434:437,881⟩,⟨1013:1015,889⟩,1022,890,
⟨1085:1086,890⟩,⟨1092:1093,891⟩;
DELETES =
1107,121,⟨1108,122:123⟩,
⟨418,521:522⟩,
1113,117,⟨1115,116:118⟩,
⟨680:684,45⟩,691,46,890,81,890,83,911,346,912,345,⟨509:510,453⟩,
920,403,547,382$
LABELS: LIST =
530 2435 1760,530 2020 710,
999 892 486,999 339 1138,999 1487 1417,
570 536 870,530 750 1140,520 804 1146,530 866 1146,
530 1125 1066,570 1154 999,520 1209 1014,530 1138 936,
570 1145 865,530 1121 807,570 1202 822,530 371 1567,
570 1504 170,530 1381 410,570 1407 441,520 1413 404,
530 1409 368,530 1449 376,570 1453 422,530 1533 525,
530 1690 590,570 1740 641,530 1755 689,570 1824 707,
530 1859 739,570 1912 761,530 1915 806,
530 1899 892,520 2035 738,570 2001 878,520 2210 798,
530 2231 764,530 2146 858,570 2171 846,530 2186 876,
530 2230 859,570 2255 848,530 2205 974,530 1697 278,
570 1713 314,530 1761 331,570 1808 342,570 1818 208,
520 2020 428,570 1934 338,530 1979 158,570 1992 280,
570 2035 238,530 1895 496,570 1993 499,530 2164 302,
570 2425 306,530 2318 380,530 2370 327,520 2367 238,
530 2455 232,570 2330 224,999 2366 160,530 2183 206,
570 2227 149,570 2431 647,570 2333 840,530 2381 861,
570 2338 1070,530 2104 1224,999 2324 1228,530 2436 1392,
530 2441 1755 $
```

5.4 Editing POLLY Printout

A printout of a normally terminated POLLY run will consist of the following sections:

1. File names or reel numbers.
2. Header record input from cards.
3. Header record resulting from tape header record merged with card input record.
4. List of corrections for binary map:
   a. Additions input cards.
   b. Sorted list of additions.
   c. Deletions input cards.
   d. Sorted list of deletions.
5. List of labels:
   a. Label input cards.
   b. Sorted list of labels.
6. Output header record.
7. Local label list.
8. Detailed list of extracted polygons.
9. Summary record of number and area of polygons.
10. Confirmation of writing of output file.

For the purpose of editing, this output can be considered in two groups: Items 1-5 deal with input; items 6-10 deal with output.

The printout is organized for the use in editing rather than as a record of data. Errors during input are usually recording, format, or keypunch errors. There are two groups of errors: those that stop the program and those that do not. It is best to start looking at the back of the printout to see if any input errors hve stopped the program. A list of fatal error messages follows:

CONTROL CARD ERROR

Required control sections are not present, are misspelled, or there is a punctuation error. (See section 2.3.)

INPUT/OUTPUT FILE SPECIFICATION ERROR

An input file is required and has not been specified. (See section 2.3 for proper deck setup.)

INPUT FILE IS WRONG MODE

A file with the correct Forest, Map and Layer, was read but it is the wrong mode for the selected program. See section 2.3.2.2 for more information on MODE.

CANNOT RECOGNIZE THE LABEL nnn

The left-hand side of a header record entity (nnn) is misspelled. (See Section 2.3)

INPUT CARD ERROR

The header record card has a format error. (See Section 2.3.)

TOO MUCH DATA ON INPUT CARDS

The total amount of data in the header record is more than the program can handle. See the programer responsible for RID*POLY maintenance.

READ ERROR WHILE READING CORRECTIONS DECK

This error results from format errors such as missing or extra commas, extra brackets, or lack of a record terminator. See the sections on Editing the Binary Map (section 4.4) and on Card Formats (section 2.3).

CORRECTION OUT OF RANGE ROW i COLUMN j

A row or column exceeds the maximum number of rows or columns in the map. The maximum are found in the header record labelled SCAN ROWS and SCAN COLUMNS

CARD INPUT ERROR

This message indicates a format error while reading labels. (See section 5.2 for label format.)

END OF FILE WHILE READING LABEL DECK

The usual cause is a missing record terminator.

n IS TOO MANY POLYGONS FOR THE ARRAY SIZE

The label array is not large enough. See the programer responsible for RID*POLY maintenance.

If the POLLY printout is not terminated by one of the preceding error messages, the following message may appear in the listing of label input cards. (Processing continues after this error.)

NO COORDINATES FOUND FOR THIS LABEL nn

A recording or keypunching error has resulted in no coordinates being associated with the label nn. This label is ignored and processing continues.

The remaining error messages result from logical errors in the data. They are found during the process of extracting polygons. The messages will be interspersed with the detailed list of polygons. To be able to correct logical errors in the data, some understanding of the polygon extracting algorithms is needed.

Figures 5.1 and 5.2 show the results of thinning the examples illustrated in figures 4.1 and 4.2. Figures 5.3 through 5.7 duplicate figures 4.1, 4.2, 5.1 and 5.2 with the ADD and DELETE corrections applied.

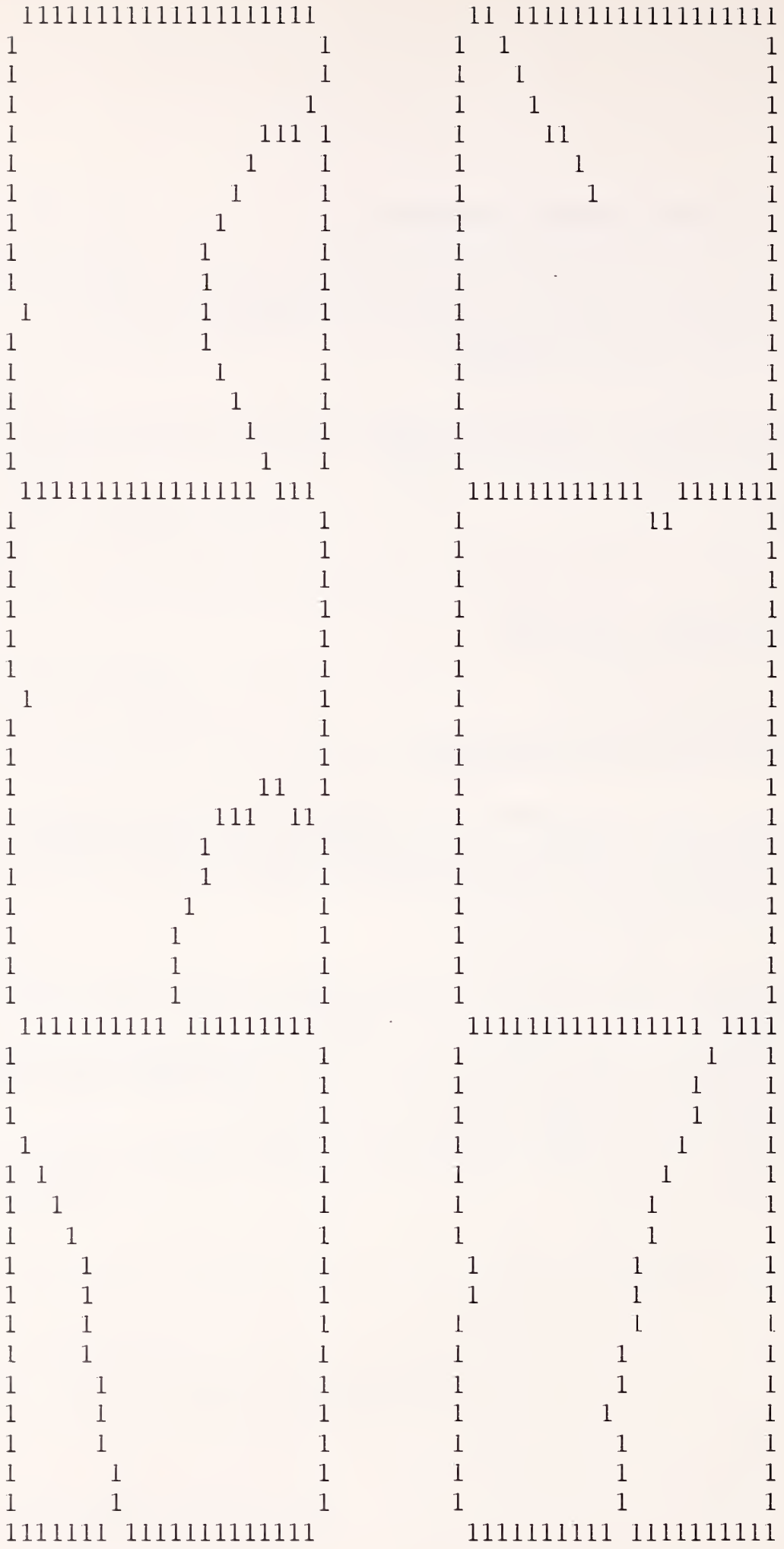


Figure 5.1.—Results of thinning the example in figure 4.1 without making ADDS.

Figure 5.2.—Results of thinning the examples in figure 4.2 without making DELETES.

Figure 5.3.—Results of making ADDS in the examples in figure 4.1.

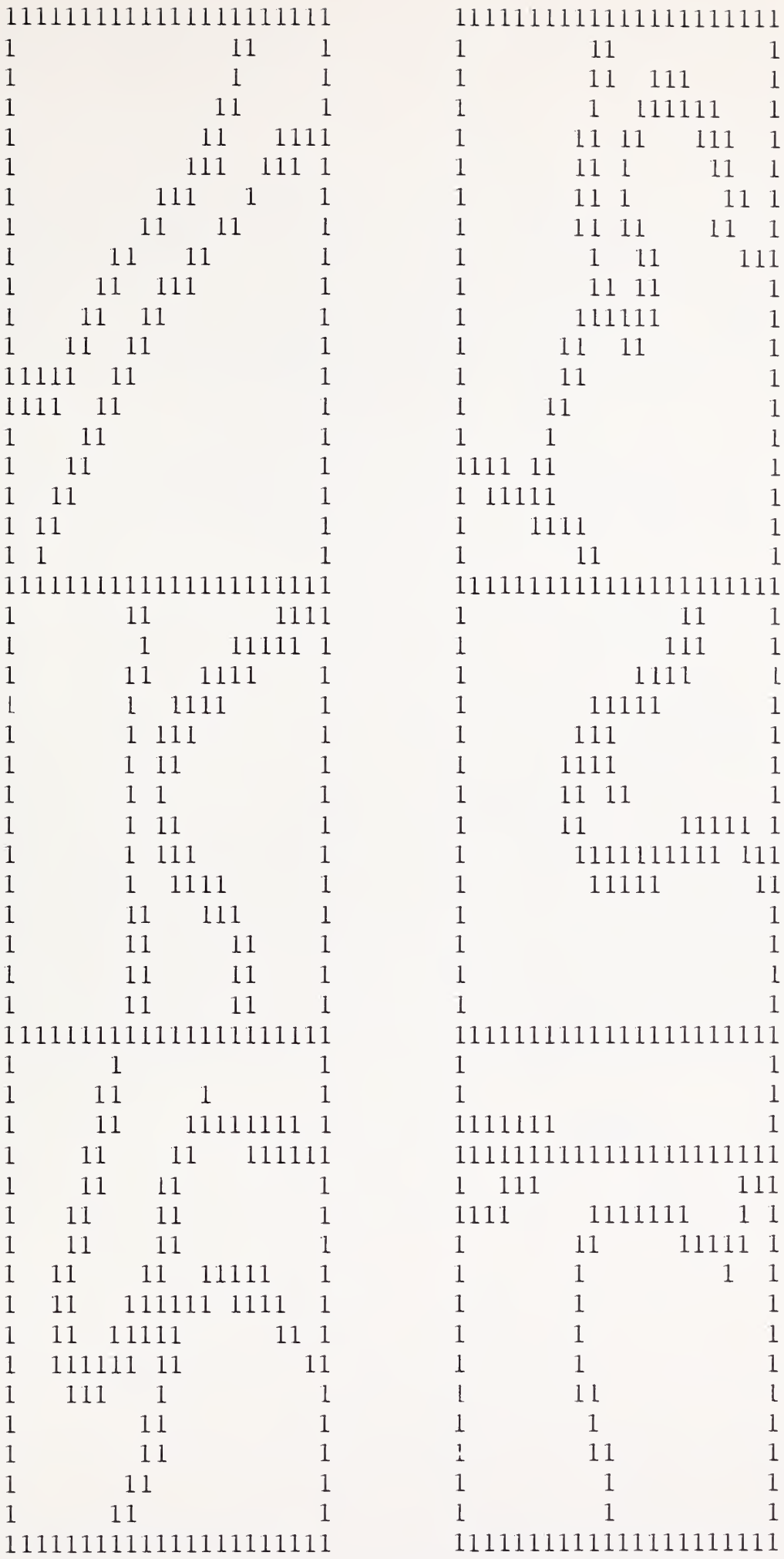


Figure 5.4.—Results of making DELETES in the examples in figure 4.2.

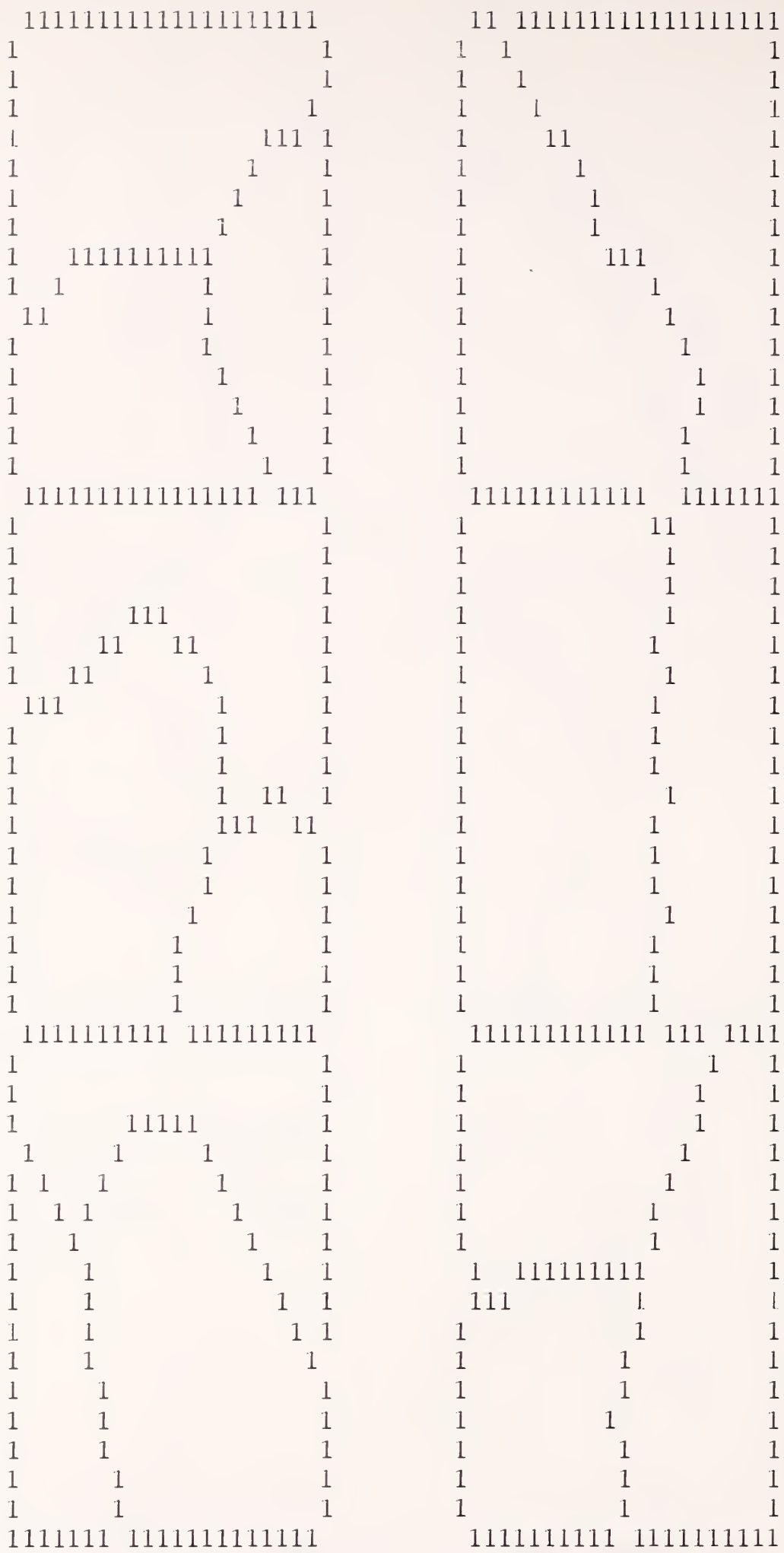


Figure 5.5.—Results of thinning the examples in figure 5.3.

Figure 5.6.—Results of thinning the examples in figure 5.4.

The polygon extractor starts with a label location in the binary map. The label location is found in the POLLY program by transforming the x-y label map coordinates into row-column grid coordinates. Starting at the column of the label location, the row is scanned to the right until a line is encountered. The line is followed clockwise around the polygon. At any intersection the closest line in the counterclockwise direction is taken. The line is followed until the starting point is reached. When a deadend is encountered the last bit in the line is eliminated, and the program attempts to continue following the line. If the next bit back along the line is now a deadend it is eliminated. This backing up continues until a bit is found which can continue the line or until a fifth bit would be eliminated. When a fifth deadend bit is encountered in a string the program abandons the attempt to extract the polygon. If the program successfully returns to the starting point it creates an artificial deadend by filling in the row of the label location from the starting point to the label position. This artificial deadend is used to detect multiple labels in a single polygon.

With the operation of this algorithm in mind, we can describe the correction of the data errors signaled by the following error messages. Several of the error messages are followed by this label printout:

LABEL NUMBER = n, LABEL = m, X = i, Y = j MAP LABEL = kkk)

where:

n is the position of the label in the input card deck,
m is the position of the label in the local label list,
i, j are the label location in map coordinates,
kkk is the label.

Error messages that begin with 10 asterisks terminate processing of that polygon, while error messages with 5 asterisks are warning messages.

**********LABEL LOCATION OUT OF RANGE**********

When the x-y label location in map coordinates is converted to row-column in grid coordinates, one of the coordinates is outside of the range 1 to SCAN ROWS or SCAN COLUMNS. The label printout following this message locates the label in the card deck and on the original map so that it can be corrected.

*****THE FOLLOWING LABEL IS ON OR ADJACENT TO A LINE*****

The label location given in the label printout that follows this message may be in error. Its location near a line may also keep other errors from being detected.

**********REACHED EDGE OF MAP**********

The scan to the right has gone to the last column and has not encountered any line. The label location in the following label printout may have been misread or improperly recorded. When labeling a small polygon along the top, right, or bottom edge, a small error in either map or grid control points could put the label outside of the map perimeter.

POLYGON TOO LONG. STOPPED AT ROW i, COLUMN j LABEL AT ROW k COLUMN n

The polygon has more than the maximum number of points allowed in its border (see section 2.7). The following label printout will locate the polygon on the original map. The polygon must be cut into at least two smaller polygons by adding one bits to the binary map using correction cards. A new label must be added to the label deck for each new polygon created.

**********SCAN INTERRUPTED BY ISLAND**********

LABEL AT ROW i, COLUMN j

The polygon boundary does not enclose the label and is therefore an island inside the polygon for which the label was intended. Find the island using the label printout that follows the error message. Eliminate the island by means of correction cards.

*****DEADEND ENCOUNTERED*****

DEADEND AT ROW i COLUMN j X = x, Y = y,

POLYGON LABEL AT ROW i, COLUMN j

This is followed by a label printout and one of the three following messages. If the deadend is artificial, the left end is near a previously used label location, that label is found and this message is printed:

**********THE FOLLOWING LABEL IS WITHIN 5 HUNDREDTHS OF THE DEADEND**********

This is followed by a label printout. The two labels are in the same polygon. They can be found in the sorted label list and on the original map so that the conflict can be resolved. If the two labels appear to be in adjacent polygons on the map and their label locations are correctly recorded, a gap in a line may have caused the thinning algorithm to erase the boundary between the two polygons.

If no label is found within 0.05 inch (1.27 mm) of the deadend it is assumed to be a real, not artificial, deadend. In this case a 40-row by 40-column piece of the binary map is printed. The piece is centered on the deadend. For short deadends this printout should be sufficient for correcting the error. For more complex cases, the FREQTB or BIPRIN printout will have to be referenced. Deadends less than 5 bits long will be eliminated from the boundary by the program and need not be corrected with delete cards.

**********MORE THAN 4 DEADENDS**********

The following message is printed and processing of this polygon is terminated when the deadend is more than 4 bits long:

**********DEADEND AT BEGINNING AND END OF POLYGON**********

When a second label in a polygon is on the same row as the first label, the artificial deadend is not seen as a deadend in the usual way. This message is followed by a label printout for the current label and a label printout for the label within 0.05 inch (1.27 mm) of the deadend.

When POLLY has tried to extract a polygon for each label read in, it compares the number of labels read with the number of polygons extracted. If these figures are not equal, the output tape is written and the run terminated. If the figures are equal and the area of the enclosing polygon is within one part in 4,000 of the sum of the areas of the enclosed polygons, the output file is written and the run terminated. If, however, a polygon has been extracted for every label and some of the area of the map is still not accounted for or is duplicated, a second stage of processing is entered if the CHECK HOLES option was specified (see section 5.3). POLLY fills in the area of the binary map represented by each labeled polygon. It then searches the map for remaining holes. If a one-cell hole is found, a message is printed along with the usual 40 x 40 piece of the binary map. One-cell holes are due to an error in the binary map, which can be eliminated with correction cards. All larger holes are given the label NEEDS LABEL and are extracted. If the polygon consists of less than 29 points, the 40 x 40 piece of binary map is printed because most of these small polygons are due to errors in the binary map that can be corrected. All valid polygons can be properly labeled and located in a subsequent run. If there are islands in the map, the process of filling the island and the sur-

rounding polygon produces a hole where the island belongs. If the area of enclosed polygons exceeds the area of the enclosing polygon, each polygon labeled NEEDS LABEL should be checked for being an island on the map. Islands can be eliminated using correction cards.

Occasionally, due to poor quality input or careless editing, a map will have many interrelated errors. In such cases, it is sometimes difficult to find the causes of all the errors. It is best then to rerun POLLY with as many corrections as possible. Many of the remaining errors will disappear and the rest will be easier to correct.

6. PLOTTING A MAP (CHART)

CHART plots the polygons on a digital plotter, allowing a map to be checked visually. The map display consists of polygons with their identification, x and y scales in map coordinates, and a title which is an extract of the header record.

Input Cards:

1. System cards.

```
//(JOB CARD)
//PROCLIB DD DSN = GINDX.Y1978.USFS.PROCLIB,DISP = SHR
// EXEC WRIS,PROG = CHART
//INPUT DD *
```

2. RID*POLY control cards.
   a. FILES: (required) contains input tape reel number.
   b. HEADER: (required) contains forest, map, and layer.
   c. HEADER UPDATES: (optional) allows changes to be made in the header record for printer and plotter output only.
   d. OPTIONS: (optional).
      SKIPS = n, causes the input tape to be positioned forward over n map-files.
   e. POLYGON SELECTIONS: (optional). This section is used to select a subset of polygons from the input map-file (see section 2.3.2.9).
   f. PLOT OPTIONS: (optional) allows user to specify the following options:
      i. MAGNIFICATION = factor; this is the amount of blow-up or reduction to be made on the plotted output. The default value is a factor of 1.0.
      ii. PLOT CONTROL POINTS: this option is used to plot hash marks at each map control point location. The default is to plot only the map control points which fall in the area selected to be plotted.
      iii. This section is used to specify how a polygon is to be identified on the plotted output. Polygons can be identified by either one of the following methods:

      PLOT ITEM NUMBERS; each polygon in a map-file is assigned a unique number, refered to as an ITEM NUMBER. If this option is specified, each polygon will be plotted with its item number as the label.

      PLOT LABELS; if this option is specified, each polygon will be plotted with the label assigned to it by the POLLY program.

      PLOT LABEL NUMBERS; each unique label in a polygon map-file is assigned a number, referred to as the LABEL NUMBER. If this option is specified, each polygon will be plotted with its corresponding label number.

      PLOT NO POLYGON ID; this option is used to plot polygons without any identification.

      The default is to PLOT ITEM NUMBERS.

      iv. PLOT PERIMETER POLYGON; this option is used to plot the perimeter polygon. The default is to exclude the perimeter polygon.

      The perimeter polygon is useful for orientation, particularly when a subset of polygons is selected via the POLYGON SELECTION SECTION. Unless the PLOT PERIMETER POLYGON option is specified, only the portion of the map large enough to encompass the selected polygons is plotted. If POLYGON SELECTIONS and PLOT PERIMETER POLYGON sections both are specified, the user must be careful not to exclude the perimeter polygon in the POLYGON SELECTION SECTIONS. For example: POLYGON SELECTIONS: INCLUDE ITEMS = 25, 26,79:209,290$ PLOT OPTIONS: PLOT PERIMETER POLYGON$ would not result in the perimeter polygon being plotted because the perimeter polygon (item number 1) was excluded by the POLYGON SELECTION SECTION. The correct way is: POLYGON SELECTIONS: INCLUDE ITEMS = 1,25,26,79:209,290$ PLOT OPTIONS: PLOT PERIMETER POLYGON$

      v. THINNING TOLERANCE = X; this option is used to reduce the number of x-y coordinates that will be plotted in the perimeter of a polygon. Specifying a thinning tolerance will reduce plotting time; however, it will also reduce polygon resolution.

      The variable X is a floating point number and has a default value of 0.0 (which means no thinning is done).

vi. EXCLUDE BOUNDARIES; this option is used to eliminate the polygon boundaries on the plotted output. The map plotted will contain polygon ID's, control points, and the perimeter polygon if it exists on the input file. The default is to plot polygon boundaries.

Sample Input Deck:

```
//JOB (,,30),CHART,MSGLEVEL = (1,1),TIME = 2
//PROCLIB DD DSN = GINDX.Y1978.USFS.PROCLIB,DISP = SHR
// EXEC WRIS,PROG = CHART
//INPUT DD *
FILES: INPUT = WRIS01$
HEADER: FOREST = ST.JOE;MAP = 113; LAYER = LAND USE$
OPTIONS: SKIPS = 3$
HEADER UPDATES: FOREST = ST.JOE; MAP = 113; LAYER = LAND USE;
LOCATION = TENSED$
PLOT OPTIONS: MAGNIFICATION = .85$
```

See appendix F.2 for the actual execution of this job stream.

7. OVERLAYING MAPS (MOSAIC)

MOSAIC overlays two maps representing the same geographic area. The result is a polygon map-file in which each polygon represents the area common to a pair of polygons, one from each input map-file. (In mathematical terms, this overlay is the **intersection** of the sets of points inside the two input polygons.) The label of this new polygon is a concatenation of the two constituent labels separated by an ''&''. (For example, if the two constituent labels are PP/AGSP and 99*01*55, then the concatenated label would be PP/AGSP&99*01*55.)

If the label of the new polygon contains more than 36 characters, it will be truncated to 36 characters. This label concatenation process will continue for each successive overlay. All such pairs of overlapping input polygons are processed. If both input map-files completely cover a given geographical area with polygons, so will the resulting map-file. ''Slivers,'' or polygons of insignificant size, are disregarded. The user can specify the minimum sliver size, minimum input polygon size, and the minimum output polygon size. (See MOSAIC OPTIONS, section 7.2.i).

Polygons from either of the input map-files can be selected or excluded from the overlay process by using the conventions described in section 2.3.2.9.

The resultant map-file can be written to tape for later use. If the output map-file is not needed, only a table of acreages showing the total area for each label pair can be produced.

Multiple overlays can be run in a single job by including a set of RID*POLY control cards for each overlay to be performed (see section 7.2.j).

Input Cards:

1. System cards. (required)

```
//(JOB CARD)
//PROCLIB DD DSN = GINDX.Y1978.USFS.PROCLIB,DISP = SHR
// EXEC WRIS,PROG = MOSAIC
//INPUT DD *
```

2. RID*POLY control cards.

   a. **FILES:** (required)

   Contains input and output tape reel numbers.

   INPUT ONE = nnnnnn;- tape volume serial number of first map-file.

   INPUT TWO = mmmmmm;- tape volume serial number of second map-file.

   OUTPUT = kkkkkk;- tape volume serial number of resultant map-file.

   Specify **OUTPUT = NONE** if the resultant map-file is not wanted.

   b. **HEADER ONE:** (required)

Used to select the first map-file for processing. **FOREST, MAP**, and **LAYER** must be specified.

   c. **OPTIONS:** (optional)

   SKIPS = n; causes the first input tape to be positioned forward over n map-files.

   THINXY = X; (for first map-file)

This option is used to specify a thinning factor for the polygon perimeter thinning routine. X is a floating point number with a default value of 2.0.

The **THINXY** option should be used only to correct the **INCOHERENT OVERLAY** error message because it significantly increases MOSAIC processing time. The smaller the value of X, the fewer points will be thinned from a polygon perimeter. Generally a value of 1.75 will resolve the incoherent overlay problem.

d. POLYGON SELECTIONS: (optional)

This section is used to select a subset of polygons from the first map-file. Unwanted polygons can be deleted in this section. (See section 2.3.2.9.)

e. HEADER TWO: (required)

Used to select the second map-file for processing. FOREST, MAP, and LAYER must be specified.

f. OPTIONS: (optional)

SKIPS = n; causes the second input tape to be positioned forward over n map-files.

THINXY = X; (for second map-file). See section 7.2.c for description.

g. POLYGON SELECTIONS: (optional)

This section is used to select a subset of polygons from the second input map-file. Unwanted polygons can be deleted in this section. (See section 2.3.2.9.)

h. OUTPUT HEADER: (required)

This section is used to specify header information for the output map-file that differs from the input map-files, namely, FOREST, MAP, and LAYER.

i. MOSAIC OPTIONS:

MINIMUM INPUT POLYGON AREA = X;

This option is used to specify the minimum area which polygons from the input map-files may contain. Polygons that have areas less than the specified value of X will be excluded from the overlay process.

The variable X is a floating point number representing acres. The default value is 5.0 acres.

The MINIMUM INPUT POLYGON AREA option is used to screen polygons from both input map-files. If the user wishes to screen the input map-files separately, then the INCLUDE AREAS GREATER THAN or EXCLUDE AREAS GREATER THAN options of the POLYGON SELECTION section should be used. However, the MINIMUM INPUT POLYGON AREA takes precedence, therefore, the user must set its value lower than the values of the INCLUDE or EXCLUDE options.

For example:

```
FILES: INPUT ONE = CC3930; INPUT TWO = CC7183; OUTPUT = CC6404$
HEADER ONE: FOREST = ST.JOE; MAP = 33; LAYER = HABITAT$
OPTIONS: SKIPS = 4$
POLYGON SELECTIONS: INCLUDE AREAS GREATER THAN = 15.0$
HEADER TWO: FOREST = ST.JOE; MAP = 30; LAYER = STAND$
OPTIONS: SKIPS = 1$
POLYGON SELECTIONS: INCLUDE AREAS GREATER THAN 5.00$
OUTPUT HEADER: MAP = 33; LAYER = HABITAT/STAND$
MOSAIC OPTIONS: MINIMUM INPUT POLYGON AREA = 0.0$
```

In the above example, the minimum acceptable polygon size is 15 acres for the first map-file and 5 acres for the second map-file. The MINIMUM INPUT POLYGON AREA value was set to 0.0 acres so that it would not override the previous selections.

MINIMUM OUTPUT POLYGONS AREA = X;

This option is used to select a minimum size for output polygons. Polygons, constructed during the overlay process, which have areas less than the value of X will be excluded from the tabular output and the output polygon map-file.

The variable X is a floating point number representing acres. X has a default value of 5.0 acres.

MINIMUM MAP SLIVER WIDTH = X1;
or
MINIMUM GROUND SLIVER WIDTH = X2;

A sliver is a polygon of insignificant size, generally long and narrow, which is produced when polygon boundaries almost coincide.

Either of these options is used to specify the minimum width a polygon may have. If the width of a polygon is less than the specified value of X1 or X2, then the polygon is a sliver and will be excluded from the tabular listing and polygon output map-file.

The minimum sliver width should be specified in either ground or map measurements, but not both. Ground width represents the actual distance a polygon covers on the ground and must be specified in feet. Map width is the distance the polygon width covers on the map and must be specified in inches.

For example, if the area within 250 feet of a stream is of interest to a user, then MINIMUM GROUND SLIVER WIDTH = 250.0; should be specified. However, if the actual ground distance is not known, then a minimum acceptable width should be selected from the map, for example MINIMUM MAP SLIVER WIDTH = .04;

The default value for sliver width is calculated by: sliver width = 0.04 * map scale/12.0. For example, 0.04 * 126720.0/12.0 = 422.40 feet.

j. END$ (optional)

Signals the end of RID*POLY control sections for the current map. This section must be included if control sections for another map follow.

Sample Input Deck:

```
//JOB (,,50),MOSAIC,MSGLEVEL = (1,1),TIME = 5
//PROCLIB DD DSN = GINDX.Y1978.USFS.PROCLIB,DISP = SHR
// EXEC WRIS,PROG = MOSAIC
//INPUT DD *
FILES: INPUT ONE = WIRS01; INPUT TWO = WRIS01; OUTPUT = NONE$
HEADER ONE: FOREST = ST.JOE; MAP = 59; LAYER = HABITAT;
STATE = IDAHO;ZONE = 3$
OPTIONS: SKIPS = 3$
HEADER TWO: FOREST = ST.JOE; MAP = 113; LAYER = LAND USE;
STATE = IDAHO;ZONE = 3$
OPTIONS: SKIPS = 3$
POLYGON SELECTIONS: INCLUDE AREAS GREATER THAN = 5.09$
OUTPUT HEADER: FOREST = ST.JOE;LAYER = HABITAT/LAND USE;MAP = 113;
LOCATION = TENSED,
STATE = IDAHO; ZONE = 3$
MOSAIC OPTIONS: MINIMUM INPUT POLYGON AREA = 2.0;
                MINIMUM OUTPUT POLYGON AREA = 1.0;
                MINIMUM GROUND SLIVER WIDTH = 150.0$
```

See appendix F.5 for the actual execution of this job stream.

8. COMBINING POLYGON MAP-FILES (MERGE)

MERGE combines two polygon map-files into one map-file. This routine was developed to aid in the polygon extraction process (POLLY). Generally, the first pass through POLLY will result in the extraction of the majority of polygons. However, if all polygons are not extracted successfully, corrections must be made and POLLY rerun on the entire map until all errors are resolved. This process may become expensive on large maps or on maps that require several POLLY runs. Thus, the following procedure can be used to reduce the processing required to produce a final map-file:

1. Run the first POLLY and save the polygon output map-file.
2. Make the necessary corrections and rerun POLLY, using **only** the polygon labels that were not extracted in the first POLLY run. Repeat this step until all errors are resolved.
3. After all errors have been resolved in Step 2, the MERGE routine should be used to combine the polygon map-files from Steps 1 and 2 to produce a complete polygon map-file.

Caution must be used in the merging procedure discussed in the previous section. Since polygons are extracted in two separate runs (Step 1 and Step 2), duplicate labels within a polygon cannot be detected between the two runs. The polygons in Step 2 should be edited carefully to avoid duplicate labels. The MERGE routine will print a total area figure for all polygons contained in the output map-file. This figure should be compared to the area of the perimeter polygon. If the total area figure is greater than the perimeter polygon area, there are duplicate labels within a polygon. If the total area figure is less than the area of the perimeter polygon, then some polygons have been missed in the extraction process. In either case, CHART can be used to produce a visual display to resolve discrepancies.

The perimeter polygon for the output map-file will be selected from one of the input map-files. If both input map-files have a perimeter polygon, the perimeter polygon from the first map-file will be selected automatically. If the perimeter polygon from the second map-file is wanted, the POLYGON SELECTION section should be used to delete the perimeter polygon from the first map-file.

To reduce processing time and cost, the first map-file in MERGE should contain the largest of the two map-files. Generally this map-file will be the polygon map-file produced by Step 1 of the procedure discussed above.

Input Cards:

1. System cards. (required)

```
//(JOB CARD)
//PROCLIB DD DSN = GINDX.Y1978.USFS.PROCLIB,DISP = SHR
// EXEC WRIS,PROG = MERGE
//INPUT DD *
```

2. RID*POLY control cards.

a. FILES: (required) Contains input and output tape reel numbers.
INPUT ONE = nnnnnn; - tape volume serial number of first map-file.
INPUT TWO = mmmmmm; - tape volume serial number of second map-file.
OUTPUT = kkkkkk; - tape volume serial number for output map-file. Specify OUTPUT = NONE; if the resultant map-file is not to be saved.

b. HEADER ONE: (required)

Used to select the first map-file for processing. FOREST, MAP, and LAYER must be specified.

c. OPTIONS: (optional)
SKIPS = n; causes the first input tape to be positioned forward over n map-files.

d. POLYGON SELECTIONS: (optional)

This section is used to select a subset of polygons from the first input map-file. Unwanted polygons can be deleted in this section. (See section 2.3.2.9.)

e. HEADER TWO: (required)

Used to select the second map-file for processing. FOREST, MAP, and LAYER must be specified.

f. OPTIONS: (optional)
SKIPS = n; causes the second input tape to be positioned forward over n map-files.

g. POLYGON SELECTIONS: (optional)

This section is used to select a subset of polygons from the input map-file. Unwanted polygons can be deleted in this section. (See section 2.3.2.9.)

h. OUTPUT HEADER: (optional)

This section is used to specify header information for the output map-file, which differs from the input map-files, namely, MAP and LAYER. If this section is not included, the output header record will be built automatically from the two input map-files.

Sample Input Deck:

```
//JOB (,,50),MERGE,MSGLEVEL = (1,1),TIME = 2
//PROCLIB DD DSN = GINDX.Y1978.USFS.PROCLIB,DISP = SHR
// EXEC WRIS,PROG = MERGE
//INPUT DD *
FILES: INPUT ONE = WRIS01; INPUT TWO = WRIS01$
HEADER ONE: FOREST = ST.JOE; MAP = 59; LAYER = HABITAT$
OPTIONS: SKIPS = 3$
HEADER TWO: FOREST = ST.JOE; MAP = 113; LAYER = LAND USE$
OPTIONS: SKIPS = 3$
OUTPUT HEADER HEADER: FOREST = ST.JOE;LAYER = LAND USE;MAP = 113$
```

9. MISCELLANEOUS MAP-FILE CORRECTIONS (TONIC)

TONIC allows various corrections and changes to be made to be polygon map-file.

Input cards:

1. System cards.

```
//(JOB CARD)
//PROCLIB DD DSN = GINDX.Y1978.USFS.PROCLIB,DISP = SHR
// EXEC WRIS,PROG = TONIC
//INPUT DD *
```

2. RID*POLY control cards.

a. FILES: (required)

Contains input and output file names.

INPUT = mmmmmm; - tape volume serial number of the polygon input map-file.

OUTPUT = nnnnnn; - tape volume serial number on which the corrected polygon map-file is to be written.

If the output map-file is not wanted, specify OUTPUT = NONE;.

b. HEADER: (required)

This section is used to select a polygon map-file for processing. FOREST, MAP, and LAYER must be specified.

c. OPTIONS: (optional)

SKIPS = n; causes the input tape to be forward spaced n map-files.

d. HEADER UPDATES: (optional)

This section is used to make corrections or additions to the header record.

e. POLYGON SELECTIONS: (optional)

This section is used to select a subset of polygons from the input map-file. Unwanted polygons can be deleted in this section. (See section 2.3.2.9.)

f. LABEL COMBINATIONS: (optional)

This section is used to aggregate two or more labels under a new label. The format for combining labels is 'label = list of labels'. The new label is specified on the left-hand side of the ' = ' sign. This label will be assigned to all polygons that have a label matching a label specified in the list on the right-hand side of the ' = ' sign. The label list (right-hand side) is a list of labels separated by commas and terminated with a simicolon. The last label combination set should be terminated by a dollar sign to signify the end of the LABEL COMBINATIONS section. A new label (left-hand side) cannot appear on the right-hand side of any label combination. Labels in the list of labels (right-hand side) should not appear in a list of labels (right-hand side) of another label combination. For example, LABEL COMBINATIONS: 500 = 510,520,530$

This section can be used also to change labels. For example, the label STATE can be changed to STATE LAND by the following control card:

LABEL COMBINATIONS: STATE LAND = STATE$

g. NEW LABELS: (optional)

This section is used to relabel individual polygons. The format is 'item number, new label'. The new label is assigned to the polygon with the specified item number. Each entry is separated by a semicolon and the last entry is terminated with a dollar sign (NEW LABELS: 2,SPRUCE;6,GRAND FIR;20,CEDAR$).

h. NEW LABELS BY LOCATION: (optional)

This section is used to assign a new label to a polygon by specifying its label coordinates. (The label coordinates of a polygon can be obtained from a POLLY, CHART, or MOSAIC job listing.) Its format is LABEL x y,. The x and y coordinates should be specified without decimal points. Each entry should be followed by a comma and the last entry should be terminated with a dollar sign.

i. NEW LABEL LOCATIONS: (optional)

This section is used to change a polygon's label location. The format is 'item number, x,y'. The polygon specified by the item number will have its label moved to the specified x-y coordinates. If x and y are zero, the label location will be computed automatically. The x and y coordinates should be specified without decimal points. Each entry should be followed by a semicolon and the last entry should be terminated with a dollar sign.

j. STORE ACREAGES$ (optional)

This section is used to produce a list of labels and their corresponding acreages. The output consists of a computer printout and a deck of cards. The card deck is used by the RID*POLY routine TALLY to provide tabulations of acreage figures. This deck can be put on tape or disk by changing the //FT07F001 JCL statement. (See the programer responsible for maintaining RID*POLY at your installation.)

NOTE: This section contains no entries, thus STORE ACREAGES is followed by a dollar sign.

Sample Input Deck:

```
// JOB (,,45),TONIC,MSGLEVEL = (1,1),TIME = 2
//PROCLIB DD DSN = GINDX.Y1978.USFS.PROCLIB,DISP = SHR
// EXEC WRIS,PROG = TONIC
//INPUT DD *
FILES: INPUT = WRIS01; OUTPUT = NONE$
HEADER: FOREST = ST.JOE; MAP = 59; LAYER = HABITAT$
OPTIONS: SKIPS = 3$
HEADER UPDATES: FOREST = ST.JOE; MAP = 59; LAYER = HABITAT;
LOCATION = TENSED$
LABEL COMBINATIONS: 500 = 410,520,530$
NEW LABELS: 2,PVT; 3,880$
NEW LABELS BY LOCATION: 999 1487 1417, 998 339 1138$
NEW LABEL LOCATIONS: 4,1480,1410; 11,340,1140$
```

See appendix F.8 for the actual execution of this job stream.

10. UNIVERSAL DATA EXCHANGE FORMAT (XCHG)

A universal data exchange format has been designed to facilitate the transfer of information between polygon-based geographical information systems within the Forest Service. The RID*POLY program XCHG will convert a RID*POLY polygon map-file into the universl data exchange format. (See appendix B.4 for exchange format.)

The following system and RID*POLY control cards are required to execute XCHG:

1. System cards.

```
//(JOB CARD)
//PROCLIB DD DSN = GINDX.Y1978.USFS.PROCLIB,DISP = SHR
// EXEC WRIS,PROG = XCHG,TAPEOUT = mmmmmm,FILENUM = m1,
//NAME = location.layer
//INPUT DD *
```

where:

mmmmmm is the volume serial number of the tape on which the universal data exchange information will be written.

m1 is the file position on the output tape.

location.layer is the name that will be assigned to the data exchange file. This name should contain information which will identify the file, such as location and layer separated by a '.', for example, HAUGAN.HABITAT. This name must not contain any special characters.

2. RID*POLY control cards.

The following list contains all possible control sections for the XCHG program. (Refer to chapter 2 for more information on a specific control section.)

a. FILES: (required)

This section is used to select the input tape.

b. HEADER: (required)

This section is used to select the polygon map-file from the input tape. FOREST, MAP, and LAYER must be specified.

c. HEADER UPDATES: (optional)

This section is used to make changes to the header record. Any changes made in this section will appear on the computer printout and the universal exchange output, if applicable.

d. (OPTIONS) (optional)

This section is used to select any of the following options:

SKIPS = n; where n represents the number of map-files to skip on the input tape.

TRIM; This option will orient the polygon map-file such that the minimum x and y coordinates are 1. The default value is TRIM.

NOTRIM; This option will not reorient the x and y coordinates from the polygon map-file.

NOLABELS; This option will suppress label information from being written to the data exchange file. The default is to write label information.

e. POLYGON SELECTIONS: (optional)

This section is used to select a subset of polygons from the input map-file (see section 2.3.2.9).

f. END$ (required for multiple jobs)

This section is used to signal the end of control sections for the map currently being processed.

Sample Input Deck:

```
//JOB (,,35),XCHG,MSGLEVEL = (1,1),TIME = 2
//PROCLIB DD DSN = GINDX.Y1978.USFS.PROCLIB,DISP = SHR
// EXEC WRIS,PROG = XCHG
//WRIS.FT11F001 DD SYSOUT = A
//INPUT DD *
FILES: INPUT = WRIS01$
HEADER: FOREST = ST.JOE;LAYER = HABITAT;MAP = 59$
HEADER UPDATES: FOREST = ST.JOE;LAYER = HABITAT;MAP = 59;
LOCATION = TENSED$
OPTIONS: SKIPS = 3$
POLYGON SELECTIONS: INCLUDE ITEMS = 2:8$
```

See appendix F.9 for the actual execution of this job stream.

11. RID*POLY TO RID*GRID CONVERSION (PGRID)

The PGRID routine converts a RID*POLY polygon map-file into the RID*GRID format. Input for PGRID consists of RID*POLY control cards and a standard RID*POLY polygon map-file. Output from PGRID consists of a magnetic tape file containing RID*GRID "D,E, and F" cards, a magnetic tape file containing labels and a printed summary (see flowchart 0.2). See appendix B.5 for output tape formats.

The following system and RID*POLY control cards are needed to execute the PGRID routine:

1. System cards.

```
//(JOB CARD)
//PROCLIB DD DSN = GINDX.Y1978.USFS.PROCLIB,DISP = SHR
// EXEC WRIS,PROG = PGRID,TPOUT#1 = nnnnnn,FILE#1 = n1,
//NAME#1 = 'name',TPOUT#2 = mmmmmm,FILE#2 = m1,NAME#2 = 'name1'
//INPUT DD *
```

where:

nnnnnn is the volume serial number of the tape on which the RID*GRID D,E, and F cards will be written.

n1 is the position of the file on the output tape.

'name'* is an ID that will be assigned to magnetic tape file n1. This name should contain information which will identify the file, for example, HAUGAN.HABITAT.GRID.

mmmmmm is the volume serial number of the tape on which the labels will be written.

m1 is the position of the file on the output tape.

'name1'* is an ID that will be assigned to the magnetic tape file m1. This name should contain information which will identify the label file, for example, HAUGAN.HABITAT.GRID.LABELS.

*NOTE: name and name1 must follow the IBM dataset naming conventions.

2. RID*POLY control cards.

The following list contains all possible control sdections for the PGRID routine. (Refer to chapter 2 for a full explanation of each item.)

a. FILES: (required)

This section is used to identify the input tape.

b. HEADER: (required)

This section is used to select the input polygon map-file. FOREST, MAP, and LAYER must be specified.

c. OPTIONS: (optional)

This section is used to select the following option:

SKIPS = n; where n represents the number of map-files to skip on the input tape.

d. POLYGON SELECTIONS: (optional)

This section is used to select a subset of polygons from the input map-file (see section 2.3.2.9).

The first polygon on a RID*POLY polygon map-file is usually a perimeter polygon, which is a special polygon that encompasses all others. This polygon is not used by RID*GRID; therefore, it is automatically deleted by PGRID if one exists. If the perimeter polygon is required, it can be renamed (by the TONIC routine) and it will not be deleted.

e. END$ (required for multiple jobs)

This section is used to signal the end of control sections for the map currently being processed. If multiple jobs are executed; all RID*GRID output will be written onto the same tape file (logical unit 11) and all label information will be written onto another tape file (logical unit 13).

Sample Input Deck:

```
//JOB (,,50),PGRID,MSGLEVEL = (1,1),TIME = 2
//PROCLIB DD DSN = GINDX.Y1978.USFS.PROCLIB,DISP = SHR
// EXEC WRIS,PROG = PGRID
//WRIS.FT11F001 DD SYSOUT = A
//WRIS.FT13F001 DD SYSOUT = A
//INPUT DD *
FILES: INPUT = WRIS01$
HEADER: FOREST = ST.JOE; MAP = 59; LAYER = HABITAT$
OPTIONS: SKIPS = 3$
POLYGON SELECTIONS: INCLUDE ITEMS = 2:8$
```

See appendix F.6 for the actual execution of this job stream.

APPENDIX A. RID*POLY PROCEDURE

```
//WRIS          PROC   DSN = 'WRIS.MAPS' ,FILENUM = ,
                       TPOUT#1 = ,FILE#1 = ,NAME#1 = NULLFILE,
                       TPOUT#2 = ,FILE#2 = ,NAME#2 = NULLFILE
//*************************************************
//*                      GENERAL WRIS PROCEDURE  *
//*************************************************
//               EXEC   PGM = &PROG,REGION = 900K
//STEPLIB          DD   DSN = GINDX.Y1978.WRIS.LOADLIB,DISP = SHR
//FT03F001         DD   DSN = GINDX.Y1978.WRISDRUM,DISP = OLD
//FT04F001         DD   DUMMY
//FT05F001         DD   DDNAME = INPUT
//FT06F001         DD   SYSOUT = A
//FT07F001         DD   SYSOUT = A,DCB = (RECFM = FB,LRECL = 80,BLKSIZE = 800)
//FT08F001         DD   DSN = GINDX.Y1978.WRIS.SPLANE,DISP = SHR,DCB = BUFNO = 1,
//                      UNIT = (,,DEFER)
//FT11F001         DD   VOL = SER = &TPOUT#1,LABEL = (&FILE#1,SL,,OUT),
//                      DSN = &NAME#1,
//                      DCB = (BUFNO = 1,RECFM = FB,LRECL = 80,BLKSIZE = 8000),
//                      UNIT = (TAPE,,DEFER),DISP = (,KEEP)
//FT13F001         DD   VOL = SER = &TPOUT#2,LABEL = (&FILE#2,SL,,OUT),
//                      DSN = &NAME#2,
//                      DCB = (BUFNO = 1,RECFM = FB,LRECL = 80,BLKSIZE = 8000),
//                      UNIT = (TAPE,,DEFER),DISP = (,KEEP)
//TAPEIN           DD   DSN = &DSN,UNIT = (TAPE,,DEFER),
//                      DCB = BUFNO = 1,LABEL = (1,SL),VOL = SER = C99999,DISP = OLD
//TAPEOUT          DD   UNIT = (TAPE,,DEFER),LABEL = (&FILENUM,SL),
//                      DISP = (,KEEP),VOL = SER = CC0000,
//                      DCB = (BUFNO = 1,RECFM = FB,LRECL = 6000,BLKSIZE = 6000)
//PLOTTERC         DD   DUMMY
```

APPENDIX B. DATA FORMATS

B.0 Manual Digitizer Input to WRIS

One of the WRIS programs (HANDY) accepts manually digitized map data as an alternative to the preferred method of digitizing maps by automatic scanning. There are many devices for manual digitizing, which raises the danger of proliferating different formats for the manual data and also WRIS routines for reading the tapes containing the manual data. To prevent confusion we offer a standard format for the tapes. Today's digitizers contain microprocessors to control the formatting of their output; we presume they can be programed to produce this standard format. If not, the digitizer output will have to be computer processed into this standard format.

The WRIS User's Guide section on HANDY is required reading to understand the digitizing method.

The tape is written in ASCII code. Block size is fixed, but fixed at whatever length is efficient for the digitizer being used. A logical record does not correspond to a block. The digitizer should write an end-of-block gap (about 0.75 inch) whenever the block size has been reached, and then go on to the next block to continue the logical record.

A logical record represents an arc on the map consisting of a series of connected straight line segments recorded by moving the cursor over them on the map. The next logical record starts when you move the cursor, without recording, to another separate arc on the map and begin recording it.

The unit of measurement on the map is 0.01 inch. Digitizer output is in integer multiples of that unit. All coordinates must be positive.

The first character in a logical record gives its **mode**. That is, it tells whether the record is in ''point mode'' or ''increment mode''. In point mode the digitizer records a series of x-y coordinates. In increment mode it records an x-y point and follows that with a series of x and y increments from that starting point. The mode character is 1 for point mode, 2 for increment mode.

In **point mode**, there follows after the mode character a series of x-y coordinate pairs. x requires four digits and so does y. After a series of such x-y pairs, a ''zero'' point is recorded to indicate end-of-record. To record x = 0 and y = 0 will require eight zeroes since it must be in the same format as a real x-y pair.

In **increment mode** the mode character is also followed by an x-y coordinate pair, to establish a starting point. The coordinate pair is followed by a series of digit pairs, each pair consisting of an increment digit for x and one for y. Thus an increment may range from 0 to 9 units. One or the other must be nonzero, however, because if both are zero, that indicates the end of a logical record; that is, a pair of zeroes is end-of-record in increment mode.

Following the end-of-record indication in either mode, the next record begins with its mode character in the next character position. The end of the tape is indicated by a mode character 9.

B.1 Scanner Data Formats

B.1.1 SCANDIG Binary Output

The first block on a SCANDIG binary tape contains 92 8-bit ASCII codes. The format is:

0000	I4
sequence number	I4
forest	A24
layer	A24
map	I4
bits/pixel	I4
scan line length	I4
number of scan lines	I4
threshold value	I4
increment	I4
x length	I4
y offset	I4
y length	I4

The second and succeeding blocks contain map information in binary form (a ''1'' representing polygon boundaries and a ''0'' representing the area inside a polygon). Each block contains as many complete scan lines as will fit in a 6000-byte buffer.

B.1.2 PASEDENA PDS 1010A Density Format

The PASEDENA PDS 1010A scanner produces a density tape that is processed by the FREQTB program, version FREQ1. Each record within a file contains 96 bytes of scanner information and 2*n bytes of density readings (n is the number of scan positions across a map).

The number of scan positions is calculated once, because it does not change within a file. The number of scan positions is calculated as follows:

1. Concatenate low order 6 bits of bytes 83 and 84 to produce a 12 bit binary number, namely, byte 83 = 101101_2 and byte 84 = 110110_2 concatenated produces 101101110110_2 (2936_{10}).
2. Subtract the 12 bit binary number from 4096 to get the number of scan columns.

The density values are produced by concatenating the 5 low order bits of the first byte with the high-order bit from the second byte to produce a 6 bit binary number. This binary number is the density reading for a given scan position. For example, if byte one = 110101_2 and byte two = 100111_2, then the density value would be 101011_2 or 43_{10}.

The number of scan rows is equivalent to the number of records in the file. Thus, the density readings should be processed row-by-row until an end-of-file is encountered.

B.2 Binary Map-File Format (MODE 1)

The BIPRIN program uses FREQTB output or binary data (from the SCANDIG scanner or a previous BIPRIN run) as input and produces a binary map-file. A BIPRIN binary map-file is written in the following format.

Item	Length (words)	Contents
NWTOT	1	Total number of words in the map-file.
NH	1	Number of words in header record.
HED	NH	Header record.
NL	1	Number of words in label array (always 3 for BIPRIN).
LBL	NL	Label record (dummy array occupying 3 full words).
NI	1	Number of words in the INDEX (equivalent to the scan rows in a map).
INDX	NI	Index, containing the length of each scan row.
S_1	INDX(1)	First scan row.
S_2	INDX(2)	Second scan row.
.		
.		
.		
S_{NI}	INDX(NI)	Last scan row.
IOTA	10	IOTA array, dummy array of 10 words (not used in IBM version).

A binary map-file in this format can be recycled through BIPRIN for further editing or it can be used as input for the polygon extraction program (POLLY).

B.3 Polygon Map-File Format (MODE 2)

All polygon map-files produced by POLLY and used by CHART and MOSAIC are written in the following format:

Item	Length (words)	Contents
NWTOT	1	Total number of words in the map-file.
NH	1	Number of words in the header record.
HED	NH	Header record.
NL	1	Number of words in the label record.
LBL	NL	Label record. (sec. B.3.1)
NI	1	Number of words in the polygon index.
INDX	NI	Polygon index, contains the length of each polygon stored in the file.
Z_1	INDX(1)	First polygon record. (sec. B.3.2)
Z_2	INDX(2)	Second polygon record.
.		
.		
.		
Z_{NI}	INDX(NI)	Last polygon record.
IOTA	10	IOTA array, not used for anything in the IBM version.

B.3.1 Label Record Format

The label record in a polygon map-file contains a list of labels which are referenced by the polygon records. The label record is in the following (packed) format:

Item	Description
NW	# of words to follow in label record.
NUMLAB	# of labels.
LOCLAB(NUMLAB)	LOCLAB(J) is the character position of the last character of the Jth label.
LABELS(N)	Character array containing the labels, (N = NW – 1 – NUMLAB).

B.3.2 Polygon Record Format

Each polygon record contains a FAX record, which describes certain attributes of a polygon, and the x-y coordinates of the polygon perimeter. To conserve space, the FAX record and x-y coordinates are stored in packed format. The coordinates are stored with a x and y coordinate in one word of storage (each occupies a half word - 16 bits). The FAX record is stored in the following format:

Packed format *(stored)*	Unpacked format *(usable)*
FAX(1) = POLYGON SEQ.NO; POLYGON TYPE	FAX(1) = POLYGON SEQ. NO
FAX(2) = POLYGON AREA	FAX(2) = POLYGON TYPE
FAX(3) =	FAX(3) = POLYGON AREA
FAX(4) = POLYGON LENGTH	FAX(4) =
FAX(5) = POLYGON LABEL INDEX	FAX(5) = POLYGON LENGTH
FAX(6) = X CO-ORD; Y CO-ORD OF LABEL	FAX(6) = POLYGON LABEL INDEX
FAX(7) = MIN X; MIN Y	FAX(7) = X CO-ORD OF LABEL
FAX(8) = MAX X; MAX Y	FAX(8) = Y CO-ORD OF LABEL
FAX(9) =	FAX(9) = MIN X
	FAX(10) = MIN Y
	FAX(11) = MAX X
	FAX(12) = MAX Y
	FAX(13) =
	FAX(14) =

B.4 Universal Data Exchange Format

The Universal DATA EXCHANGE Format was designed as a means of transferring data from one computer to another without costly conversions.

Even though card image form is not the most efficient, it is universally acceptable. The information accounted for by this format is: (1) header information, which consists of literal and descriptive information about the work area; (2) control information, which is the user identified control for the data; (3) label information for identification of the pertinent digitized data; and (4) point, line, and polygon information for individual polygons. The header information is contained on two cards and the control information is two records per card and as many cards as required to complete the control list. Label information is three records per card and as many cards as necessary to complete the list. Point, line, and polygon information is recorded on two cards; the first showing pertinent individual data string characteristics and the second giving the x and y values for points on the string. Ten coordinates per card and as many cards as required will be accepted as one data string.

Header Information - Record Type 1a

Columns	Field description	Format
1-36	Forest name	9A4
37-45	Compartment-Location	2A4,A1
46-80	Layer name or names	8A4,3A1

Descriptive Information - Record Type 1b

Columns	Field description	Format
1-6	Number of polygons (strings)(1)	I6
7-12	Number of unique labels(2)	I6
13-18	Scale (reference fraction)(3)	I6
19-24	Number of control points(4)	I6
25-48	Layer envelope (X-Y/Min-Max)(5)	4I6
49-54	Area in 0.01 in² units	I6
55-60	Number of layers overlaid	I6
61-66	Originating system name	A6

(1) Must equal the number of record type 4a cards.
(2) Must equal the number of labels (3/card) on record type 3 cards.
(3) Denominator of scale (1/24,000 map = 24000).
(4) Must equal the number of points (2/card) on record type 2 cards.
(5) MIN and MAX X-Y of all polygons, excluding control points.

*NOTE: All records are in card image (i.e., 80 characters per record in length) and are blank filled when not used. This format is used to transmit data on tape between computers.

Control Information - Record Type 2

Columns	Field description	Format
1-6	Map x-coordinate	I6
7-12	Map x-coordinate	I6
13-22	Latitude (decimal degrees)-(0.00001 degree units)	I10
23-32	Longitude (decimal degrees)-(0.00001 degree units)	I10
33-38	Map x (next point)	I6
39-44	Map y (next point)	I6
45-54	Latitude	I10
55-64	Longitude	I10

*The number of control points must agree with the number specified in column 19-24, and Record Type 1a. When column 19-24 in Record Type 1a is zero, this record type does not exist; when it is not zero, two control points are entered per card.

Label Information - Record Type 3

Columns	Field description	Format
1-24	LABEL	6A4
25-48	LABEL	6A4
49-72	LABEL	6A4

The number of labels (3 labels/card) must agree with the number of labels specified in column 7-12 in Record Type 1a. The position of the label in the list indicates its label number as described in column 11-15 of Record Type 4a.

Polygon, Point, Line Information - Record Type 4a

Columns	Field description	Format
1	Type, 1 = point, 2 = line, 3 = polygon	I1
2-5	Point, polygon, line number	I4
6-10	Number of points in pt., polygon, or line(1)	I5
11-15	Label number	I5
16-20	Label or point location (MAP X coordinate)	I5
21-25	Label or point location (MAP Y coordinate)	I5
26-30	Polygon envelope (Min-X)	I5
31-35	Polygon envelope (Min-Y)	I5
36-40	Polygon envelope (Max-Y)	I5
41-45	Polygon envelope (Max-Y)	I5
46-51	Polygon area in 0.01 in^2 units	I6

(1) Must agree with the number of points on the following Record Type 4b cards.

Polygon or Line Cards - Record Type 4b

Columns	Field description	Format
1-4	X-Y Map coordinate pair	2I4
9-16	X-Y coordinate pair	2I4
17-24	X-Y coordinate pair	2I4
etc.		
.		
.		
.		
.		
73-80		

There is a maximum of 10 points per card, each with an x and y value or a maximum of 20 records per card. All references to map coordinates are in 0.01 inch units.

B.5 RID*GRID Magnetic Tape Formats

This section contains format information for the output tapes produced by the RID*POLY PGRID routine. For more information reference the RID*GRID User's Manual.

B.5.1 D,E, and F Tape Format

The RID*GRID D,E, and F input records are written onto logical unit 11, which is assigned to a magnetic tape. The records are 80 bytes long and blocked in groups of 80, DCB = (RECFM = FB,LRECL = 80,BLKSIZE = 8000). This file consists of one ''D'' card, one ''E'' card and a variable number of ''F'' cards. See appendix F.6 for a sample listing of this file.

B.5.2 Label Tape Format

The labels corresponding to the polygons output onto logical unit 11 are written to logical unit 13. The length of each record is 80 bytes, however, only the first 36 bytes are used for label information. The labels on this file correspond to the list produced on PGRID printout. An example of a label file is given in appendix F.6.

The DCB information for this file is: RECFM = FB, LRECL = 80, BLKSIZE = 8000.

APPENDIX C. METRIC CONVERSION

The RID*POLY system is currently based on the English system of measurement. To convert RID*POLY to the metric system, the changes listed in table C.1 must be made.

In the English version, map control points (section 3.1) and label coordinates (section 3.2) are recorded in hundredths of inches. Thus, map linear units of 1 inch are represented by ''100'' on input to POLLY (SCL = 0.01). For the metric version, map control points and label coordinates should be recorded in millimeters. Thus, map linear units of 1 centimeter would be represented on input to POLLY by ''10'' (SCL = 0.1).

Table C.1 Source code changes required for metric conversion

WRIS program	Control section	English system	Metric system
POLLY	BLOCK DATA	DATA SCL,HT/.01,.07/	DATA SCL,HT/.1,.07/
	NABOR	DATA SCL,TH/.01,.07/	DATA SCL,TH/.1,.07/
CHART	BLOCK DATA	SCL,HT/.01,.07/	SCL,HT/.1,.07/
	SELFIX	FEET = RF/12. ACRE = FEET**2/43560.	FEET = RF/39.37008 ACRE = FEET**2/10000
	PRNACR	ACRE = RF**2/67272640. FEET = RF/12. .2X,'ITEM',7X,'LOCATION',5X,'(FEET)',4X,'(ACRES)',3X,'LABEL'/)	ACRE = RF**2/(1000.*39.37008**2) FEET = RF/39.37008 .2X,'ITEM',7X,'LOCATION',5X,'(CM.)',4X,'(HECT.)',3X,'LABEL'/
	ITMTOT	FACT = RF**2/6272640. CALL PRNFLO(AR,4,20,'TOTAL AREA (SQ.IN.)') CALL PRNFLO(ACRES,0,18,'TOTAL AREA (ACRES') CALL PRNFLO(DIST,2,26,'TOTAL LINE LENGTH (INCHES)')	FACT = RF**2/(10000.*39.37008**2) CALL PRNFLO(AR,4,20,'TOTAL AREA (SQ.CM)') CALL PRNFLO(ACRES,0,18,'TOTAL AREA (HECTARES)') CALL PRNFLO(DIST,2,26,'TOTAL LINE LENGTH (CENTIMETERS)')
MOSAIC	BLOCK DATA	DATA SCL,HT/.01,.07/	DATA SCL,HT/.1,.07/
	SELFIX	Same as CHART	Same as CHART
	ITMTOT	Same as CHART	Same as CHART
	FRAME	ACRE = F**2/6272640.	ACRE = F**2/(10000*39.37008**2)
	MAIN	*YGONS COMPRISING $I ACRES THAT ARE TOO SMALL TO INCLUDE@', *R POLYGONS COMPRISING $I ACRES@',NULLPO,NULLAC) * 2X,'ACRES',2X,'LABEL',32X,'ITEM',2X,'MINX',2X,'MINY',2X,'MAXX', * 2X,'MAXY',2X,'ACRES',2X,'ACRES')	*YGONS COMPRISING $I HECTARES THAT ARE TOO SMALL TO INCLUDE@', *R POLYGONS COMPRISING $I HECTARES@',NULLPO,NULLAC) * 2X,'HECT.',2X,'LABEL',32X,'ITEM',2X,'MINX',2X,'MINY',2X,'MAXX', * 2X,'MAXY',2X,'HECT.',2X,'HECT.')
	TABLET	CALL PRNTAB(TAB,NLP,NLP,NLQ,LBLP,LBLQ,ACRE,TS,AREA,8,'ACREAGES')	CALL PRNTAB(TAB,NLP,NLP,NLQ,LBLP,LBLQ,ACRE,TS,AREA,7,'HECTARES')

APPENDIX D. DISTRIBUTION NOTES FOR THE IBM VERSION OF RID*POLY

The enclosed tape contains the IBM 360-370 version of RID*POLY. Included on this tape are: FORTRAN and assembly source code, test data, and executable load modules for all RID*POLY programs.

The RID*POLY load modules may be loaded directly onto an IBM 360-370 system, thus eliminating the source code compilation procedures. The load modules were produced on an IBM 360/65 (OS/MVT) and can be executed on any IBM 360-370 system that is upwardly compatible from the 360/65. (The load modules have been loaded and executed on an IBM 370/145 (OS/VS1) without modifications.) At our installation, plotter output is spooled to a disk pack and plotted online. Other installations may spool the plotter output to a tape and plot offline. This difference may require the plotter tape to be initialized in the chart source code.

The RID*POLY programs require a direct access disk file on which to perform intermediate data processing. This file, GINDX.Y1978.WRISDRUM, requires 300 tracks of space on model 3330 disk pack. (The data set name prefix "GINDX.Y1978" is a convention used at our installation for accounting purposes and may vary at other installations.) Installations which have accounting procedures that are Input/Output dependent should create this file in the first BIPRIN run and save it for subsequent runs. Installations with accounting procedures that are not I/O dependent may treat this file as a temporary data set for each job.

The RID*POLY programs use assembly routines TREAD and TWRITE to read and write data on standard-label tapes. The routines can process any file on a given tape with only one DD (data definition) card (//TAPEIN DD for input and //TAPEOUT DD for output). There is one restriction, however; all data set names must be DSN = WRIS.MAPS.

All RID*POLY programs have a data definition card (//FT04F001 DD DUMMY) for logical unit four, which has been assigned to a dummy unit. The original UNIVAC 1108 version of WRIS used this unit for record keeping during the development phase. This feature was retained in the IBM version for future expansion of the system. Until this feature is used, unit four should be assigned to a dummy unit.

In files 20 thru 28 on the distribution tape, TAPEOUT has been assigned to dummy units. These units should be assigned to valid tape files at your installation so that they may be used in subsequent runs. All files necessary for testing purposes have been supplied on the distribution tape. All test files except the initial BIPRIN input file should be created and used by the RID*POLY programs at your installation as a further test of the complete sequence of components.

The distribution tape is a 9-track 1600 BPI standard-label tape. The volume serial number is WRIS01 (VOL = SER = WRIS01). The following paragraphs briefly describe the data contained on each file.

File #1
DSN: WRIS.MAPS
DCB: RECFM = VBS,LRECL = 6000,BLKSIZE = 6004
DESCRIPTION: Scandig scanner binary map-file. Test input for BIPRIN program.

File #2
DSN: WRIS.MAPS
DCB: RECFM = FB,LRECL = 80,BLKSIZE = 800
DESCRIPTION: Digitizer map file for testing HANDY.

File #3
DSN: WRIS.MAPS
DCB: RECFM = VBS, LRECL = 6004,BLKSIZE = 6008
DESCRIPTION: Binary map-file produced by BIPRIN which can be used as input to POLLY.

File #4
DSN: WRIS.MAPS
DCB: RECFM = FB,LRECL = 6000,BLKSIZE = 6000
DESCRIPTION: Polygon map-file produced by the POLLY program which can vbe used as input to MOSAIC, MERGE, TONIC, or XCHG.

File #5
DSN: WRIS.MAPS
DCB: RECFM = VBS,LRECL = 6004,BLKSIZE = 6008
DESCRIPTION: Polygon map-file produced by POLLY which can be used as input to MOSAIC, MERGE, TONIC, or XCHG.

File #6
DSN: WRIS.MAPS
DCB: RECFM = FB,LRECL = 6000,BLKSIZE = 6000
DESCRIPTION: Dummy file to signal end of tape for RID*POLY programs.

Files 7 thru 18 contain the source code for the RID*POLY programs. They all have: DCB = (RECFM = FB, LRECL = 80,BLKSIZE = 12960).

File #	DSN
7	WRIS.ASSEMBLY.SOURCE
8	WRIS.COMMON.SOURCE
9	WRIS.FUNCTION.SOURCE
10	WRIS.HANDY.SOURCE
11	WRIS.BIPRIN.SOURCE
12	WRIS.POLLY.SOURCE
13	WRIS.CHART.SOURCE
14	WRIS.MOSAIC.SOURCE
15	WRIS.MERGE.SOURCE
16	WRIS.TONIC.SOURCE
17	WRIS.XCHG.SOURCE
18	WRIS.PGRID.SOURCE

File #19
DSN: GINDX.Y1978.WRIS.SPLANE
DCB: RECFM = FB,LRECL = 80,BLKSIZE = 800
DESCRIPTION: State plane coordinate transformations for POLLY and MOSAIC.

Files 20 thru 28 contain test data for the WRIS programs. They all have: DCB = (RECFM = FB,LRECL = 80, BLKSIZE = 800)

File #	DSN
20	WRIS.BIPRIN.TEST
21	WRIS.HANDY.TEST
22	WRIS.POLLY.TEST
23	WRIS.CHART.TEST
24	WRIS.MOSAIC.TEST
25	WRIS.MERGE.TEST
26	WRIS.TONIC.TEST
27	WRIS.XCHG.TEST
28	WRIS.PGRID.TEST

File #29
DSN: GINDX.Y1978.WRIS.LOADLIB
DCB: RECFM = FB,LRECL = 80,BLKSIZE = 800
DESCRIPTION: This file contains the GINDX.Y1978.WRIS.LOADLIB partitioned data set, which consists of the object modules for ASSEMBLY, COMMON, and FUNCTION and the load modules for BIPRIN, POLLY, CHART, MERGE, TONIC, XCHG, and MOSAIC. The IBM utility IEHMOVE was used to unload this PDS onto the distributon tape. File 30 contains the JCL needed to load this file onto disk using the IEHMOVE utility. This PDS requires 350 tracks of space on a 3330 disk pack.

File #30
DSN: DSN = WRIS.IEHMOVE
DCB: RECFM = FB,LRECL = 80,BLKSIZE = 800
DESCRIPTION: This file contains the JCL for the IBM utility IEHMOVE, which will load the PDS GINDX.Y1978.WRIS.LOADLIB (file 29) onto disk.

File #31
DSN: WRIS.PROC. DCB: RECFM = FB,LRECL = 80,BLKSIZE = 800
DESCRIPTION: This file contains the JCL procedure required to execute the RID*POLY programs. See appendix A for listing.

File #32
DSN: XWRIS.ROUTINES
DCB: RECFM = FB,LRECL = 125,BLKSIZE = 13000
DESCRIPTION: This file contains the RID*POLY RUNSTREAM GENERATOR routines. They are written in WYLBUR EXEC language.

The following steps should be followed to produce a load module for the RID*POLY system:

Step 1: Compile the assembly routines contained in File #7 and store object module as member ASSEMBLY in a PDS.
Step 2: Compile the FORTRAN IV subroutines common to all programs contained in File #8 and store the resultant object module as member COMMON in the PDS created in Step 1.
Step 3: Compile the FORTRAN IV function routines contained on File #9 and save the object module as member FUNCTION in the Step 1 PDS.
Step 4: Compile the source code contained in File #10, link in the object modules produced in Steps 1 through 3, and store the resultant load module as member HANDY in the Step 1 PDS.
Step 5: Repeat Step 4 for files 11 through 18 and store each under the appropriate name.

The above steps will produce a RID*POLY load module library that is ready to execute. Each file on the distribution tape contains the JCL required to execute a specific task. The JCL was designed to execute at Washington State University Computing Center and may require minor modifications to execute at other installations.

Table D.1—Distribution tape contents

VOLUME = WRIS01
1600 BPI, 9-TRACK, IBM STANDARD LABEL

LABEL	DATASET NAME	BLOCK COUNT	RECFM	LRECL	BLKSIZE
1	WRIS.MAPS	25	VBS	6000	6004
2	WRIS.MAPS	3	FB	80	800
3	WRIS.MAPS	25	VBS	6004	6008
4	WRIS.MAPS	6	FB	6000	6000
5	WRIS.MAPS	3	VBS	6004	6008
6	WRIS.MAPS	0	FB	6000	6000
7	WRIS.ASSEMBLY.SOURCE	12	FB	80	12960
8	WRIS.COMMON.SOURCE	30	FB	80	12960
9	WRIS.FUNCTION.SOURCE	3	FB	80	12960
10	WRIS.HANDY.SOURCE	8	FB	80	12960
11	WRIS.BIPRIN.SOURCE	7	FB	80	12960
12	WRIS.POLLY.SOURCE	20	FB	80	12960
13	WRIS.CHART.SOURCE	14	FB	80	12960
14	WRIS.MOSAIC.SOURCE	29	FB	80	12960
15	WRIS.MERGE.SOURCE	9	FB	80	12960
16	WRIS.TONIC.SOURCE	15	FB	80	12960
17	WRIS.XCHG.SOURCE	8	FB	80	12960
18	WRIS.PGRID.SOURCE	10	FB	80	12960
19	GINDX.Y1978.WRIS.SPLANE	12	FB	80	800
20	WRIS.BIPRIN.TEST	1	FB	80	800
21	WRIS.HANDY.TEST	1	FB	80	800
22	WRIS.POLLY.TEST	5	FB	80	800
23	WRIS.CHART.TEST	1	FB	80	800
24	WRIS.MOSAIC.TEST	2	FB	80	800
25	WRIS.MERGE.TEST	1	FB	80	800
26	WRIS.TONIC.TEST	2	FB	80	800
27	WRIS.XCHG.TEST	2	FB	80	800
28	WRIS.PGRID.TEST	2	FB	80	800
29	GINDX.Y1978.WRIS.LOADLIB	4111	FB	80	800
30	WRIS.IEHMOVE	2	FB	80	800
31	WRIS.PROC	3	FB	80	800
32	XWRIS.ROUTINES	12	FB	125	13000

APPENDIX E. RID*POLY RUNSTREAM GENERATOR

The RID*POLY runstream generator is a collection of interactive routines that generate job streams for the RID*POLY programs and perform the necessary file maintenance. Although the routines were developed to operate on the WYLBUR conversational text editing and RJE/RJO system, they could be implemented on any computer installation that supports interactive computing or conversational text editing.

The runstream generator consists of two types of routines, RID*POLY routines and system routines. The RID*POLY routines set up job streams for the various RID*POLY programs, for example, MOSAIC, POLLY, BIPRIN, etc. The system routines set up job streams for the file management system programs, for instance, moving a map-file from one tape to another and deleting a map-file.

The runstream generator routines require access to a map-file data base and a transaction file. The map-file data base is used to maintain a record of all RID*POLY map-files. A map-file is a tape data set that contains map information in either density, binary, or polygon format. The locations (tape reel number and file number) of all map-files used for input are retrieved from this data base. The locations of all output map-files are entered into this data base.

The map-file data base contains temporary and permanent map-files. A temporary map-file is any file produced by RID*POLY program. Temporary map-files are written onto tapes that reside in a scratch pool. When a temporary map-file becomes final, the system routine MOVE is used to copy it onto a tape residing in the permanent tape pool, thus it becomes a permanent map-file.

The transaction file is used to record all transactions that transpire during a session.

When a user signs on the system, control is given to the master routine (#XWRIS). This routine loads the map-file data base and the transaction file onto primary storage (high-speed direct access device). The user is then queried for the name of a program to be run, for example, MOSAIC, POLLY, MOVE, DELETE, etc. Once a program has been selected, its corresponding routine is loaded and control is passed to it. The selected routine queries the user for information required to set up a runstream. It accesses the map-file data base for Input/Output information and records the activity in the transaction file. Upon completion, the generated runstream is sent to the batch processor. If the user rishes to generate another runstream using the routine that is loaded, control is passed to the beginning of the routine. Otherwise, control is returned to the master routine. At this point the user can either select another program or exit. Upon exit, the master routine copies the map-file data base and the transaction file onto secondary storage and the session is terminated.

The following material is a sample session in which runstreams are generated and submitted for both WRIS and system programs.

```
EXEC FROM $.WRIS

WRIS RUNSTREAM GENERATOR
------------------------

TIME - 16:13:15; DATE - 05/07/80

ENTER ACCOUNT FOR THIS SESSION:
********
ENTER THE USER/GROUP INITIALS OF THE DATASETS YOU WISH TO ACCESS
(I.G., 'DANIM'): DANIM
ENTER FOREST YOU WANT TO WORK WITH: ST. JOE

                    WRIS CONTROL PROGRAM.

ENTER PROGRAM TO EXECUTE (CR TO EXIT; -1 FOR INFO): -1

PROGRAM       DESCRIPTION
-------       -----------
ALLOCATE      ALLOCATES A TAPE FROM THE WSU TAPE POOL.
BIPRIN        BIPRIN RUNSTREAM GENERATOR.
CHART         CHART RUNSTREAM GENERATOR.
DECBACK       BACKS UP EITHER POLLY OR BIPRIN DECKS TO TAPE.
DECKRES       RESTORES EITHER POLLY OR BIPRIN DECKS.
DELETE        DELETES A MAP-FILE FROM A TEMPORARY TAPE.
EDIT          EDITS A BIPRIN OR POLLY FILE.
HANDY         HANDY RUNSTREAM GENERATOR.
MERGE         MERGES TWO POLYGON MAP-FILES.
MOSAIC        MOSAIC RUNSTREAM GENERATOR.
MOVE          MOVES A MAP-FILE FROM A TEMPORARY TO A PERMANENT TAPE.
PGRID         WRIS TO GRID DATA CONVERTER.
POLLY         POLLY RUNSTREAM GENERATOR.
RELEASE       RELEASES A TAPE BACK TO THE WSU TAPE POOL.
TONIC         TONIC RUNSTREAM GENERATOR.
XCHG          XCHG RUNSTREAM GENERATOR.

ENTER PROGRAM TO EXECUTE (CR TO EXIT; -1 FOR INFO): BIPRIN

* * * * *  BIPRIN RUNSTREAM GENERATOR  * * * * *

LAYER: HABITAT
LOCATION: TENSED

-TAPE- WRIS01
LAB M FOREST      MAP# LAYER                    LOCATION          DATE
--- - ------      ---- -----                    --------          ----
3   1 ST.JOE        59 HABITAT                  TENSED            04/23/80
IS THIS THE MAP-FILE YOU WANT? NO

"HABITAT, TENSED" COULD NOT BE FOUND IN THE "STJOELOG" FILE.
DO YOU WISH TO TRY ANOTHER? OK
LAYER: TENSED HAB.
LOCATION: TENSED
```

```
-TAPE- WRISO1
LAB M FOREST      MAP# LAYER                          LOCATION          DATE
--- - --------    ---- ------                         ----------        ----
1   1 ST.JOE      2017 TENSED HAB.                    TENSED            04/23/80
IS THIS THE MAP-FILE YOU WANT? YES

DO YOU WANT TO UPDATE THE HEADER RECORD? OK
ENTER THE FOLLOWING INFORMATION AS YOU WOULD LIKE IT TO APPEAR IN
THE OUTPUT MAP-FILE.
FOREST (MAX 10 CHARS): ST.JOE
LAYER (MAX 24 CHARS.): HABITAT
LOCATION (MAX 16 CHARS.): TENSED
MAP NUMBER: 59

* * * YOUR MAP-FILE WILL BE WRITTEN TO *WRIS12, LABEL 1.

OPTIONS SECTION:
----------------------

DO YOU WANT TO PRINT CORNERS, ALL, NONE, OR WINDOW? CORNERS
DO YOU WANT TO THIN THE BINARY MAP? YES
NUMBER OF PASSES FOR THINNING: 3
DO YOU WANT TO FLIP THE BINARY MAP? NO

ENTER MEMBER IN "BIPRNOKS" WHERE CORRECTIONS ARE (CR-NONE):
DO YOU WANT TO ENTER ANY CORRECTIONS? NO
DO YOU WANT A LIST OF THE RUNSTREAM? OK

        BIPRIN RUNSTREAM

// WRISRUN JOB (,,50),BIPRIN,MSGLEVEL=(1,1),TIME=5
//PROCLIB DD DSN=GINDX.Y1978.USFS.PROCLIB,DISP=SHR
// EXEC WRIS,PROG=BIPRIN,FILENUM=1
//INPUT DD *
FILES: INPUT=WRISO1; OUTPUT=WRIS12$
HEADER: FOREST=ST.JOE;LAYER=TENSED HAB.;MAP=2017$
HEADER UPDATES: FOREST=ST.JOE; LAYER=HABITAT; MAP=59;
LOCATION=TENSED$
OPTIONS: NUMBER OF MAPS=1; PRINT=CORNERS; THIN; ITERATIONS=3$

OK TO RUN? OK
PRIORITY: DELAY
JOB -- 4338 WRISRUN  SENT TO JES2.
DO YOU WANT TO RUN ANOTHER "BIPRIN" JOB? NO

                    WRIS CONTROL PROGRAM.

ENTER PROGRAM TO EXECUTE (CR TO EXIT; -1 FOR INFO): CHART

* * * * *  CHART RUNSTREAM GENERATOR  * * * * *

MODE - 2)POLLY OR 3)MOSAIC: 2
LAYER: LAND USE
LOCATION: TENSED
```

```
-TAPE- WRISO1
LAB M FOREST      MAP# LAYER                          LOCATION          DATE
--- - ------      ---- -----                          --------          ----
5   2 ST.JOE       113 LAND USE                       TENSED            04/23/80
IS THIS THE MAP-FILE YOU WANT? YES
DO YOU WANT A PLOT? OK
DO YOU WANT TO SPECIFY ANY PLOT OPTIONS? OK

OPTIONS: 1) MAGNIFICATION FACTOR
         2) PLOT CONTROL POINTS
         3) POLYGON LABELING
         4) PLOT PERIMETER POLYGON

ENTER PLOT OPTION NUMBER (CR - EXIT): 1
ENTER MAGNIFICATION FACTOR: .85

ENTER PLOT OPTION NUMBER (CR - EXIT):
DO YOU WISH TO SELECT A SUBSET OF POLYGONS? NO
DO YOU WANT A MYLAR PLOT? NO
DO YOU WANT A LIST OF THE RUNSTREAM? YES

       CHART RUNSTREAM

//WRISRUN JOB (,,9999),CHART,MSGLEVEL=(1,1),TIME=5
//PROCLIB DD DSN=GINDX.Y1978.USFS.PROCLIB,DISP=SHR
// EXEC WRIS,PROG=CHART
//PLOTTERC DD SYSOUT=(Q,PLOTWTR,WTP),DEST=LOCAL
//INPUT DD *
FILES: INPUT=WRISO1$
HEADER: FOREST=ST.JOE; MAP=113; LAYER=LAND USE$
HEADER UPDATES: FOREST=ST.JOE; MAP=113; LAYER=LAND USE;
LOCATION=TENSED$
OPTIONS: SKIPS=4$
PLOT OPTIONS:  MAGNIFICATION=.85$

OF TO RUN? OK
PRIORITY: DELAY
JOB --- 4347 WRISRUN  SENT TO JES2.
DO YOU WANT TO RUN ANOTHER "CHART" JOB? NO

                    WRIS CONTROL PROGRAM.

ENTER PROGRAM TO EXECUTE (CR TO EXIT; -1 FOR INFO): HANDY

* * * * *  HANDY RUNSTREAM GENERATOR  * * * * *

LAYER: LAND USE
LOCATION: BUZZARD

 TAPE- WRISO1
LAB M FOREST      MAP# LAYER                          LOCATION          DATE
--- - ------      ---- -----                          --------          ----
2   5 ST.JOE       100 LAND USE                       BUZZARD ROUST     04/23/80
IS THIS THE MAP-FILE YOU WANT? YES
```

```
DO YOU WANT TO UPDATE THE HEADER RECORD? NO

* * * YOUR MAP-FILE WILL BE WRITTEN TO *WRIS13, LABEL 1.

DO YOU WANT A LIST OF THE RUNSTREAM? YES

        HANDY RUNSTREAM

//WRISRUN JOB (,,35),HANDY,MSGLEVEL=(1,1),TIME=5
//PROCLIB DD DSN=GINDX.Y1978.USFS.PROCLIB,DISP=SHR
// EXEC WRIS,PROG=HANDY,FILENUM=1
//INPUT DD *
FILES: INPUT=WRIS01; OUTPUT=WRIS13$
HEADER: FOREST=ST.JOE; LAYER=LAND USE; MAP=100;
LOCATION=BUZZARD ROOST$
OPTIONS: SKIPS=1$

OK TO RUN? OK
PRIORITY: DELAY
JOB -- 4362 WRISRUN  SENT TO JES2.
DO YOU WANT TO RUN ANOTHER "HANDY"  JOB? NO

                    WRIS CONTROL PROGRAM.

ENTER PROGRAM TO EXECUTE (CR TO EXIT; -1 FOR INFO): MERGE

* * * * *  MERGE RUNSTREAM GENERATOR  * * * * *

WARNING - - - TO REDUCE PROCESSING COSTS, ALWAYS ENTER THE
LARGEST MAP-FILE FIRST.

MODE - 2)POLLY OR 3)MOSAIC: 2

ENTER FILE INFORMATION FOR FIRST MAP-FILE.
LAYER: HABITAT
LOCATION: TENSED

-TAPE- WRIS01
LAB M FOREST      MAP# LAYER                    LOCATION          DATE
--- - ------      ---- -----                    --------          ----
4   2 ST.JOE        59 HABITAT                  TENSED            04/23/80
IS THIS THE MAP-FILE YOU WANT? YES
DO YOU WANT TO ENTER ANY SELECTION CRITERIA FOR MAP-FILE ONE? NO

ENTER FILE INFORMATION FOR SECOND MAP-FILE.
LAYER: LAND USE
LOCATION: TENSED

-TAPE-*WRIS14(  1) - MERGE
LAB M FOREST      MAP# LAYER                    LOCATION          DATE
--- - ------      ---- -----                    --------          ----
1   2 ST.JOE      113  LAND USE                 TENSED            05/07/80
IS THIS THE MAP-FILE YOU WANT? NO
```

```
-TAPE- WRIS01
LAB M FOREST      MAP# LAYER                                LOCATION          DATE
--- - --------    ---- --------                             ----------        ----
5   2 ST.JOE       113 LAND USE                            TENSED            04/23/80
IS THIS THE MAP-FILE YOU WANT? YES
DO YOU WANT TO ENTER ANY SELECTION CRITERIA FOR MAP-FILE TWO? NO
DO YOU WANT TO WRITE OUTPUT FILE ONTO TAPE? NO
DO YOU WANT A LIST OF THE RUNSTREAM? OK

        MERGE RUNSTREAM

//WRISRUN JOB (,,50),MERGE,MSGLEVEL=(1,1),TIME=5
//PROCLIB DD DSN=GINDX.Y1978.USFS.PROCLIB,DISP=SHR
// EXEC WRIS,PROG=MERGE,FILENUM=1
//INPUT DD *
FILES: INPUT ONE=WRIS01; INPUT TWO=WRIS01; OUTPUT=NONE$
HEADER ONE: FOREST=ST.JOE; MAP=59; LAYER=HABITAT$
OPTIONS: SKIPS=3$
HEADER TWO: FOREST=ST.JOE; MAP=113; LAYER=LAND USE$
OPTIONS: SKIPS=4$
OUTPUT HEADER: FOREST=ST.JOE; LAYER=LAND USE; MAP=113$

OK TO RUN? OK
PRIORITY: DELAY
JOB -- 4399 WRISRUN  SENT TO JES2.
DO YOU WANT TO RUN ANOTHER "MERGE" JOB? NO

                    WRIS CONTROL PROGRAM.

ENTER PROGRAM TO EXECUTE (CR TO EXIT; -1 FOR INFO): MOSAIC

* * * * *  MOSAIC RUNSTREAM GENERATOR  * * * * *

ENTER FILE INFORMATION FOR FIRST MAP-FILE.
ENTER MODE 2)POLLY OR 3)MOSAIC: 2
LAYER: HABITAT
LOCATION: TENSED

-TAPE- WRIS01
LAB M FOREST      MAP# LAYER                                LOCATION          DATE
--- - --------    ---- --------                             ----------        ----
4   2 ST.JOE       59 HABITAT                              TENSED            04/23/80
IS THIS THE MAP-FILE YOU WANT? YES
ENTER THINNING FACTOR(CR-DEFAULT TO 2.0):
DO YOU WANT TO ENTER ANY SELECTION CRITERIA FOR MAP-FILE ONE? NO

ENTER FILE INFORMATION FOR SECOND MAP-FILE.
ENTER MODE 2)POLLY OR 3)MOSAIC: 2
LAYER: LAND USE
LOCATION: TENSED
```

```
-TAPE-*WRIS14(  1) - MERGE
LAB M FOREST      MAP# LAYER                          LOCATION          DATE
--- - --------    ---- --------                       ----------        ----
1   2 ST.JOE       113  LAND USE                       TENSED            05/07/80
IS THIS THE MAP-FILE YOU WANT? NO

-TAPE- WRIS01
LAB M FOREST      MAP# LAYER                          LOCATION          DATE
--- - --------    ---- --------                       ----------        ----
5   2 ST.JOE       113 LAND USE                       TENSED            04/23/80
IS THIS THE MAP-FILE YOU WANT? OK
ENTER THINNING FACTOR(CR-DEFAULT TO 2.0):
DO YOU WANT TO ENTER ANY SELECTION CRITERIA FOR MAP-FILE TWO? YES

POLYGON SELECTIONS SECTION.

ENTER OPTION NUMBER (CR - EXIT, -1 OPTION LISTING): -1

OPTIONS: 1) INCLUDE ITEMS=LIST OF ITEM NUMBERS;
         2) EXCLUDE ITEMS=LIST OF ITEM NUMBERS;
         3) INCLUDE TYPES=LIST OF TYPE NUMBERS;
         4) EXCLUDE TYPES=LIST OF TYPE NUMBERS;
         5) INCLUDE LABELS=LABEL LIST;
         6) EXCLUDE LABELS=LABEL LIST;
         7) INCLUDE AREAS GREATER THAN=X;
         8) EXCLUDE AREAS GREATER THAN=X;
         9) INCLUDE PERIMETERS GREATER THAN=X;
        10) EXCLUDE PERIMETERS GREATER THAN=X;
        11) INCLUDE RECTANGLE=MIN X,MAX X,MIN Y,MAX Y;

ENTER OPTION NUMBER (CR - EXIT, -1 OPTION LISTING): 7
INCLUDE AREAS GREATER THAN (IN ACRES): 5.09

ENTER OPTION NUMBER (CR - EXIT, -1 OPTION LISTING):

POLYGON SELECTION COMPLETED.
DO YOU WANT TO WRITE OUTPUT FILE ONTO TAPE? NO
DO YOU WANT TO SPECIFY ANY MOSAIC OPTIONS? OK

OPTIONS: 1) MINIMUM INPUT POLYGON AREA=X (5.0 ACRES DEFAULT);
         2) MINIMUM OUTPUT POLYGON AREA=X (5.0 ACRES DEFAULT);
         3) MINIMUM MAP SLIVER WIDTH=X1;
         4) MINIMUM GROUND SLIVER WIDTH=X2

ENTER MOSAIC OPTION NUMBER (CR - EXIT): 1
ENTER MINIMUM INPUT POLYGON AREA (IN ACRES): 2.0

ENTER MOSAIC OPTION NUMBER (CR - EXIT): 2
ENTER MINIMUM OUTPUT POLYGON AREA (IN ACRES): 1.0

ENTER MOSAIC OPTION NUMBER (CR - EXIT): 4
ENTER MINIMUM GROUND SLIVER WIDTH (IN FEET): 150.0

ENTER MOSAIC OPTION NUMBER (CR - EXIT):
```

```
DO YOU WANT A LIST OF THE RUNSTREAM? OK

        MOSAIC RUNSTREAM

//WRISRUN JOB (,,50),MOSAIC,MSGLEVEL=(1,1),TIME=5
//PROCLIB DD DSN=GINDX.Y1978.USFS.PROCLIB,DISP=SHR
// EXEC WRIS,PROG=MOSAIC,FILENUM=1
//INPUT DD *
FILES: INPUT ONE=WRIS01; INPUT TWO=WRIS01; OUTPUT=NONE$
HEADER ONE: FOREST=ST.JOE; MAP=59; LAYER=HABITAT;
STATE=IDAHO; ZONE=3$
OPTIONS: SKIPS=3$
HEADER TWO: FOREST=ST.JOE; MAP=113; LAYER=LAND USE;
STATE=IDAHO; ZONE=3$
OPTIONS: SKIPS=4$
POLYGON SELECTIONS:
INCLUDE AREAS GREATER THAN=5.09$
OUTPUT HEADER: FOREST=ST.JOE; LAYER=HABITAT/LAND USE; MAP=113;
LOCATION=TENSED;
STATE=IDAHO; ZONE=3$
MOSAIC OPTIONS: MINIMUM INPUT POLYGON AREA=2.0;
                MINIMUM OUTPUT POLYGON AREA=1.0;
                MINIMUM GROUND SLIVER WIDTH=150.0$

OK TO RUN? OK
PRIORITY: DELAY
JOB -- 4451 WRISRUN  SENT TO JES2.
DO YOU WANT TO RUN ANOTHER "MOSAIC" JOB? NO

                    WRIS CONTROL PROGRAM.

ENTER PROGRAM TO EXECUTE (CR TO EXIT; -1 FOR INFO): PGRID

* * * * *  PGRID RUNSTREAM GENERATOR  * * * * *

ENTER MODE - 2)POLLY OR 3)MOSAIC: 2
LAYER: HABITAT
LOCATION: TENSED

-TAPE- WRIS01
LAB M FOREST      MAP# LAYER                    LOCATION          DATE
---- - --------   ---- --------                 ------------      --------
4    2 ST.JOE       59 HABITAT                  TENSED            04/23/80
IS THIS THE MAP-FILE YOU WANT? YES
DO YOU WISH TO SELECT A SUBSET OF POLYGONS? OK

POLYGON SELECTIONS SECTION.

ENTER OPTION NUMBER (CR - EXIT, -1 OPTION LISTING): 1
ENTER "ITEMS TO BE INCLUDED" (A SEMICOLON FOLLOWING THE
LAST VALUE WILL TERMINATE THIS OPTION).
ENTER VALUES: 2:8;
```

```
POLYGON SELECTION COMPLETED.
DO YOU WANT GRID DATA WRITTEN ON: 1)CARDS OR 2)TAPE? 2
OUTPUT FILE 11 (GRID "D", "E", AND "F" CARDS):
     ENTER TAPE VOL=SER: WRIS22
     FILE ON WRIS22 TO WRITE TO: 1
     DSN FOR THAT FILE: TENSED.HABITAT.DEF.CARDS
OUTPUT FILE 13 (POLYGON LABELS):
     ENTER TAPE VOL=SER: WRIS22
     FILE ON WRIS22 TO WRITE TO: 2
     DSN FOR THAT FILE: TENSED.HABITAT.LABELS
DO YOU WANT A LIST OF THE RUNSTREAM? YES

        PGRID RUNSTREAM

//WRISRUN JOB (,,50,9999),PGRID,MSGLEVEL=(1,1),TIME=5
//PROCLIB DD DSN=GINDX.Y1978.USFS.PROCLIB,DISP=SHR
// EXEC WRIS,PROG=PGRID,
// TPOUT#1=WRIS22,FILE#1=1,NAME#1='TENSED.HABITAT.DEF.CARDS',
// TPOUT#2=WRIS22,FILE#2=2,NAME#2='TENSED.HABITAT.LABELS'
//INPUT DD *
FILES: INPUT=WRIS01$
HEADER: FOREST=ST.JOE; LAYER=HABITAT; MAP=59$
OPTIONS: SKIPS=3$
POLYGON SELECTIONS:
INCLUDE ITEMS=2:8$

OK TO RUN? OK
PRIORITY: DELAY
JOB -- 4472 WRISRUN  SENT TO JES2.
DO YOU WANT TO RUN ANOTHER "PGRID" JOB? NO
```

```
                    WRIS CONTROL PROGRAM.

ENTER PROGRAM TO EXECUTE (CR TO EXIT; -1 FOR INFO): POLLY

* * * * *  POLLY RUNSTREAM GENERATOR  * * * * *

THIS EXEC FILE REQUIRES A MEMBER TO BE STORED IN
GINDX.Y1978.POLLYDKS.  THIS FILE MUST CONTAIN: 1) CONTROL
POINTS, 2) CORRECTIONS SECTION, AND 3) LABELS SECTION.
(CHANGES CAN BE MADE BY THE #XEDIT EXEC FILE.)

ARE YOU WORKING WITH (1) BIPRIN DATA OR (2) HANDY DATA? 1
LAYER: HABITAT
LOCATION: TENSED

-TAPE-#WRIS12(  1) - BIPRIN
LAB M FOREST      MAP# LAYER                    LOCATION          DATE
--- - ------      ---- -----                    --------          ----
1   1 ST.JOE      59   HABITAT                  TENSED            05/07/90
IS THIS THE MAP-FILE YOU WANT? NO
```

```
-TAPE- WRIS01
LAB M FOREST      MAP# LAYER                          LOCATION          DATE
--- - -------      ---- -----                          --------          ----
3   1 ST.JOE         59 HABITAT                       TENSED            04/23/80
IS THIS THE MAP-FILE YOU WANT? YES

DO YOU WANT TO UPDATE THE HEADER RECORD? NO

* * * YOUR MAP-FILE WILL BE WRITTEN TO *WRIS15, LABEL 1.

          OPTIONS SECTION.
1) SWAPXY, 2) CHECK HOLES (CR-EXIT):
ENTER MEMBER NAME IN GINDX.Y1978.POLLYDKS: HTENSED
DO YOU WANT A LIST OF THE RUNSTREAM? NO
OK TO RUN? OK
PRIORITY: DELAY
JOB -- 4495 WRISRUN  SENT TO JES2.
DO YOU WANT TO RUN ANOTHER "POLLY" JOB? NO

                    WRIS CONTROL PROGRAM.

ENTER PROGRAM TO EXECUTE (CR TO EXIT; -1 FOR INFO): TONIC

* * * * *  TONIC RUNSTREAM GENERATOR  * * * * *

MODE - 2)POLLY OR 3)MOSAIC: 2
LAYER: HABITAT
LOCATION: TENSED
-TAPE-*WRIS15(  1) - POLLY
LAB M FOREST      MAP# LAYER                          LOCATION          DATE
--- - --------      ---- -------                        ----------        ----
1   2 ST.JOE        59   HABITAT                       TENSED            05/07/80
IS THIS THE MAP-FILE YOU WANT? NO

-TAPE- WRIS01
LAB M FOREST      MAP# LAYER                          LOCATION          DATE
--- - --------      ---- -------                        ----------        ----
4   2 ST.JOE         59 HABITAT                       TENSED            04/23/80
IS THIS THE MAP-FILE YOU WANT? YES
DO YOU WANT TO WRITE ONTO TAPE? NO

ENTER TONIC OPTION NUMBER(CR-EXIT,-1 OPTION LISTING): -1

OPTIONS: 1) HEADER UPDATES
         2) POLYGON SELECTIONS
         3) LABEL COMBINATIONS
         4) NEW LABELS
         5) NEW LABELS BY LOCATION
         6) NEW LABEL LOCATIONS
         7) STORE ACREAGES
```

```
ENTER TONIC OPTION NUMBER(CR-EXIT,-1 OPTION LISTING): 3
ENTER LABEL COMBINATIONS:  (80 CHARACTERS OR LESS PER LINE, A DOLLAR SIGN
FOLLOWING THE LAST VALUE WILL TERMINATE THIS OPTION).
ENTER VALUES: 500=510,520,530$

ENTER TONIC OPTION NUMBER(CR-EXIT,-1 OPTION LISTING): 4
ENTER NEW LABELS:  (80 CHARACTERS OR LESS PER LINE, A DOLLAR SIGN
FOLLOWING THE LAST VALUE WILL TERMINATE THIS OPTION).
ENTER VALUES: 2,PVT;3,880$

ENTER TONIC OPTION NUMBER(CR-EXIT,-1 OPTION LISTING): 5
ENTER NEW LABELS BY LOCATION:  (80 CHARACTERS OR LESS PER LINE, A DOLLAR SIGN
FOLLOWING THE LAST VALUE WILL TERMINATE THIS OPTION).
ENTER VALUES: 999 1487 1417, 998 339 1138$

ENTER TONIC OPTION NUMBER(CR-EXIT,-1 OPTION LISTING): 6
ENTER NEW LABEL LOCATIONS:  (80 CHARACTERS OR LESS PER LINE, A DOLLAR SIGN
FOLLOWING THE LAST VALUE WILL TERMINATE THIS OPTION).
ENTER VALUES: 4,1480,1410; 11,340,1140$

ENTER TONIC OPTION NUMBER(CR-EXIT,-1 OPTION LISTING):
DO YOU WANT A LIST OF THE RUNSTREAM? OK

        TONIC RUNSTREAM

//WRISRUN JOB (,,45),TONIC,MSGLEVEL=(1,1),TIME=5
//PROCLIB DD DSN=GINDX.Y1978.USFS.PROCLIB,DISP=SHR
// EXEC WRIS,PROG=TONIC,FILENUM=1
//INPUT DD *
FILES: INPUT=WRIS01; OUTPUT=NONE$
HEADER: FOREST=ST.JOE; MAP=59; LAYER=HABITAT$
OPTIONS: SKIPS=3$
HEADER UPDATES: FOREST=ST.JOE; MAP=59; LAYER=HABITAT;
LOCATION=TENSED$
LABEL COMBINATIONS: 500=510,520,530$
NEW LABELS: 2,PVT;3,880$
NEW LABELS BY LOCATION: 999 1487 1417, 998 339 1138$
NEW LABEL LOCATIONS: 4,1480,1410; 11,340,1140$

OK TO RUN? OK
PRIORITY: DELAY
JOB -- 4515 WRISRUN  SENT TO JES2.
DO YOU WANT TO RUN ANOTHER "TONIC" JOB? NO

                    WRIS CONTROL PROGRAM.

ENTER PROGRAM TO EXECUTE (CR TO EXIT; -1 FOR INFO): XCHG

* * * * *  XCHG RUNSTREAM GENERATOR  * * * * *

ENTER MODE - 2)POLLY OR 3)MOSAIC: 2
LAYER: HABITAT
LOCATION: TENSED
```

```
-TAPE-*WRIS15(  1) - POLLY
LAB M FOREST      MAP# LAYER                          LOCATION          DATE
--- - --------      ---- -------                        --------          ----
1   2 ST.JOE        59   HABITAT                       TENSED            05/07/80
IS THIS THE MAP-FILE YOU WANT? NO

-TAPE- WRIS01
LAB M FOREST      MAP# LAYER                          LOCATION          DATE
--- - --------      ---- -------                        --------          ----
4   2 ST.JOE        59 HABITAT                        TENSED            04/23/80
IS THIS THE MAP-FILE YOU WANT? YES

OPTIONS: 1) TRIM
         2) NOTRIM
         3) LABELS
         4) NOLABELS

ENTER OPTION NUMBER (CR TO EXIT):
DO YOU WISH TO SELECT A SUBSET OF POLYGONS? YES

POLYGON SELECTIONS SECTION.

ENTER OPTION NUMBER (CR - EXIT, -1 OPTION LISTING): 1
ENTER "ITEMS TO BE INCLUDED" (A SEMICOLON FOLLOWING THE
LAST VALUE WILL TERMINATE THIS OPTION).
ENTER VALUES: 2:8;

POLYGON SELECTION COMPLETED.
DO YOU WANT XCHG DATA WRITTEN ON: 1)CARDS OR 2)TAPE? 1
DO YOU WANT A LIST OF THE RUNSTREAM? OK

        XCHG RUNSTREAM

//WRISRUN JOB (,,35,9999),XCHG,MSGLEVEL=(1,1),TIME=5
//PROCLIB DD DSN=GINDX.Y1978.USFS.PROCLIB,DISP=SHR
// EXEC WRIS,PROG=XCHG
//FT11F001 DD SYSOUT=B
//INPUT DD *
FILES: INPUT=WRIS01$
HEADER: FOREST=ST.JOE; LAYER=HABITAT; MAP=59$
HEADER UPDATES: FOREST=ST.JOE;LAYER=HABITAT;MAP=59;
LOCATION=TENSED$
OPTIONS: SKIPS=3$
POLYGON SELECTIONS:
INCLUDE ITEMS=2:8$

OK TO RUN? OK
PRIORITY: DELAY
JOB -- 4539 WRISRUN  SENT TO JES2.
DO YOU WANT TO RUN ANOTHER "XCHG" JOB? NO
```

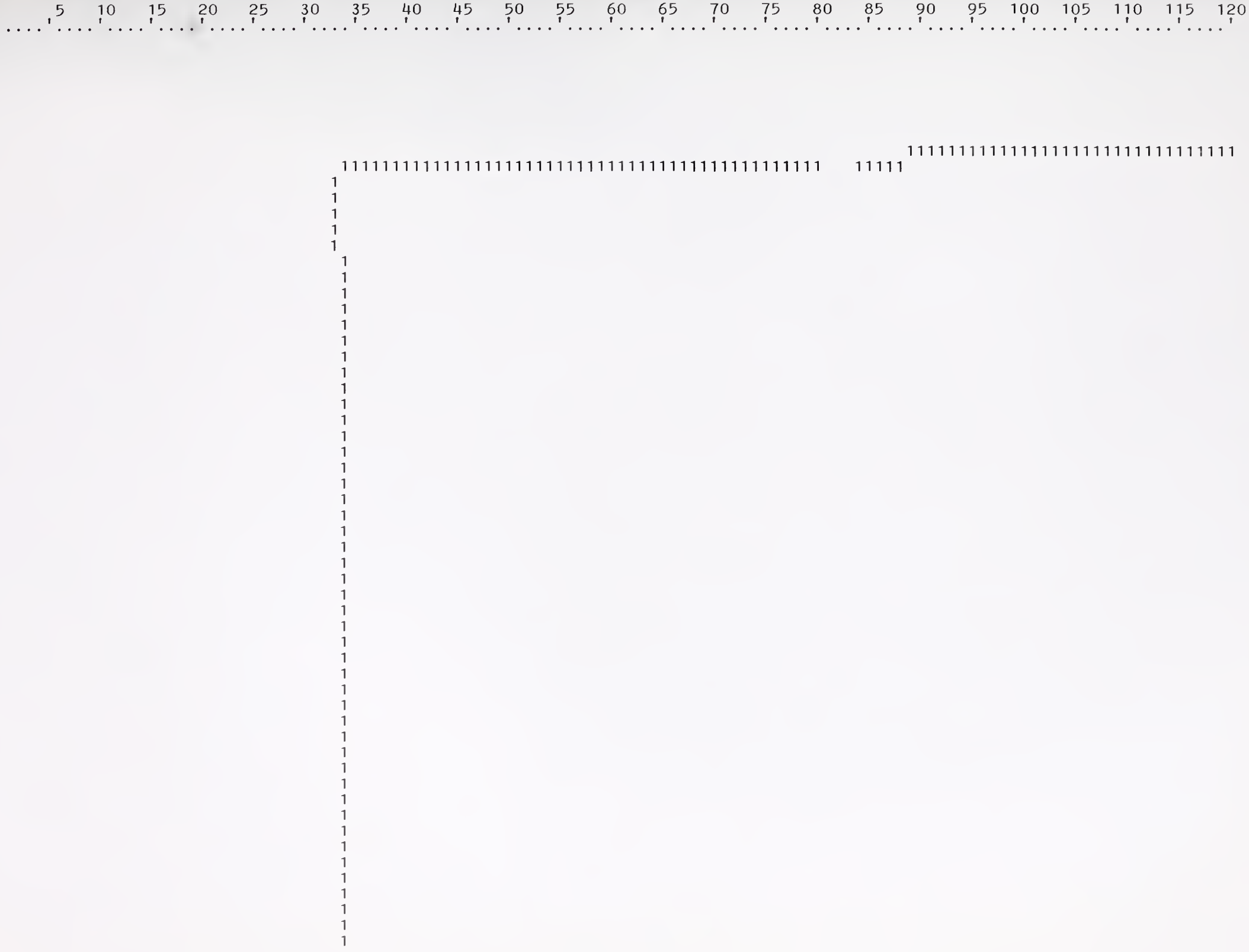
```
                    WRIS CONTROL PROGRAM.

ENTER PROGRAM TO EXECUTE (CR TO EXIT; -1 FOR INFO):
STJOELOG REPLACED ON USER04
STJOEACT REPLACED ON USER01

END OF #XWRIS SESSION.
```

APPENDIX F. RID*POLY SAMPLE RUNS

The sample runs contained in this appendix were produced from the job streams listed in previous chapters of this manual. The job stream decks are contained on the distribution tape (see appendix D).

F.1 BIPRIN

```
                                                                                BIPRIN     14 FEB 80  22:18:23    0      1
                                        INPUT CARD' FILES: INPUT=WRIS01; OUTPUT=NONE$


INPUT
   REEL WRIS01


OUTPUT
   'NONE'
                                        INPUT CARD' HEADER: FOREST=ST. JOE;LAYER=TENSED HAB.;MAP=2017$
                                        INPUT CARD' HEADER UPDATES: FOREST=ST.JOE;LAYER=HABITAT;MAP=59;
                                        INPUT CARD' LOCATION=TENSED$
                                        INPUT CARD' OPTIONS: NUMBER OF MAPS=1; PRINT=CORNERS; THIN; ITERATIONS=3$

PREPARING TO READ INPUT FILE FROM  REEL WRIS01

SCANNER SETUP...  SEQUENCE=5  BITS/PIXEL=1  THRESHOLD=95  INCREMENT=2
X LENGTH=64  Y OFFSET=26  Y LENGTH=46
   POSITION 1   ST. JOE  TENSED HAB.  MAP 2017  .309 SECONDS

HEADER RECORD
   FOREST = ST. JOE;   MAP = 2017;   LAYER = TENSED HAB.;   SCAN ROWS = 1283;   SCAN COLUMNS = 928;   MODE = 0

UPDATED HEADER RECORD
   FOREST = ST.JOE;   MAP = 59;   LAYER = HABITAT;   LOCATION = TENSED;   SCAN ROWS = 1283;   SCAN COLUMNS = 928;   MODE = 0

NO ADDITIONS OR DELETIONS
                                                                                BIPRIN    2.8734 SEC

THINNING:   6 SECONDS   3 PASSES
                                                                                BIPRIN    5.6793 SEC

MAP PIECES TO BE PRINTED:
          ROW    1 TO ROW   60, COLUMN    1 TO COLUMN  120
          ROW 1231 TO ROW 1283, COLUMN    1 TO COLUMN  120
          ROW    1 TO ROW   60, COLUMN  809 TO COLUMN  928
          ROW 1231 TO ROW 1283, COLUMN  809 TO COLUMN  928
                                                                                BIPRIN    0.0107 SEC
```


5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100 105 110 115 120
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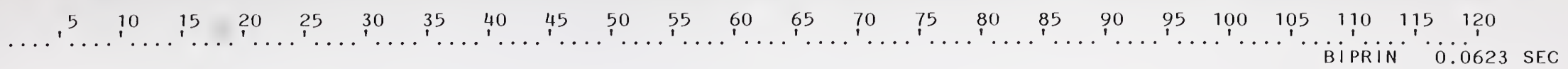
1

89 51
90 51
BIPRIN 0.1657 SEC


5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100 105 110 115 120
BIPRIN 0.0623 SEC

F.6

```
    813  818  823  828  833  838  843  848  853  858  863  868  873  878  883  888  893  898  903  908  913  918  923  928
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                                                                         1                                            78 53
```

```
                              1                                79 53
                              1                                80 53
                                                 BIPRIN   0.1652 SEC
```

F.8

```
      813  818  823  828  833  838  843  848  853  858  863  868  873  878  883  888  893  898  903  908  913  918  923  928
    ....'....'....'....'....'....'....'....'....'....'....'....'....'....'....'....'....'....'....'....'....'....'....'....'
                                                                                                          BIPRIN   0.0635 SEC

 NO OUTPUT FILE

 ************************************** END OF MAP NO.        59 ************************************************************
                                                                                                          BIPRIN   0.0145 SEC

 DATE  14 FEB 80      TIME  22:20:54

 END OF RUN
```

F.2 CHART

```
                                                                                    CHART       08 FEB 80  09:21:30     0       1
                                        INPUT CARD' FILES: INPUT=WRIS01$


INPUT
   REEL WRIS01
                                        INPUT CARD' HEADER: FOREST=ST.JOE; MAP=113; LAYER=LAND USE$
                                        INPUT CARD' OPTIONS: SKIPS=3$
                                        INPUT CARD' HEADER UPDATES: FOREST=ST.JOE; MAP=113; LAYER=LAND USE;
                                        INPUT CARD' LOCATION=TENSED$
                                        INPUT CARD' PLOT OPTIONS:  MAGNIFICATION=.85$


MAGNIFICATION     .8499996

PLOT ITEM NUMBERS

PREPARING TO READ INPUT FILE FROM  REEL WRIS01
   POSITION 4   ST.JOE  HABITAT  MAP 59  TENSED   14 AUG 79  20:49:23    8086 WORDS  .067 SECONDS     (SKIPPED)
   POSITION 5   ST.JOE  LAND USE  MAP 113  TENSED   02 MAY 78  23:59:38    3829 WORDS  .100 SECONDS

NUMBER OF POLYGONS: 23   NUMBER OF X-Y POINTS: 3502   AVERAGE NUMBER OF X-Y POINTS PER POLYGON: 152

HEADER RECORD
   FOREST = ST.JOE;   MAP = 113;   LAYER = LAND USE;   LOCATION = TENSED;   SCALE = 31680;
   GEOGRAPHIC CONTROL POINTS = 47.00000, 117.0000, 47.12500, 117.0000, 47.12500, 116.7500, 47.00000, 116.7500:
   MAP CONTROL POINTS = 100, 100, 105, 1840, 2460, 1835, 2460, 100;   GRID CONTROL POINTS = 917, 45, 36, 28, 19, 1226, 895, 1243;
   ZONE = 3;   STATE = IDAHO;   SCAN ROWS = 943;   SCAN COLUMNS = 1312;   MODE = 2;   ENVELOPE = 101, 97, 2462, 1840;
   DATE WRITTEN = 02 MAY 78;   TIME WRITTEN = 23:59:38;   REEL NUMBER = CC6938

LABELS
   1 PERIMETER   4 303
   2 999         5 PVT
   3 500


UPDATED HEADER RECORD
   FOREST = ST.JOE;   MAP = 113;   LAYER = LAND USE;   LOCATION = TENSED;   SCALE = 31680;
   GEOGRAPHIC CONTROL POINTS = 47.00000, 117.0000, 47.12500, 117.0000, 47.12500, 116.7500, 47.00000, 116.7500;
   MAP CONTROL POINTS = 100, 100, 105, 1840, 2460, 1835, 2460, 100;   GRID CONTROL POINTS = 917, 45, 36, 28, 19, 1226, 895, 1243;
   ZONE = 3;   STATE = IDAHO;   SCAN ROWS = 943;   SCAN COLUMNS = 1312;   MODE = 2;   ENVELOPE = 101, 97, 2462, 1840;
   DATE WRITTEN = 02 MAY 78;   TIME WRITTEN = 23:59:38;   REEL NUMBER = CC6938

THERE ARE 22 ITEMS TO BE PLOTTED
```

F.10

ST.JOE MAP 113 LAND USE — CHART — 08 FEB 80 09:24:14

ITEM	TYPE	LENGTH	AREA	PTS	FIRST POINT		RANGE OF X,		RANGE OF Y		LABEL LOC		CHART LABEL
2	3	2.49	0.3099	28	24.61	17.19	24.21	24.62	17.17	18.12	24.50	17.60	500
3	3	1.06	0.0465	21	3.79	15.48	3.63	3.81	15.20	15.62	3.70	15.50	500
4	3	14.55	6.8113	331	24.60	14.86	21.03	24.62	12.54	17.61	23.50	15.50	999
5	3	62.04	151.2955	916	22.45	14.85	1.03	24.61	7.05	18.40	14.00	15.00	999
6	3	2.06	0.2629	16	24.60	13.93	24.08	24.62	13.71	14.23	24.40	14.00	500
7	3	14.21	7.6692	208	24.60	12.19	21.24	24.62	9.73	14.19	23.50	12.50	999
8	3	1.86	0.1875	24	21.23	12.05	20.72	21.25	12.04	12.55	21.00	12.30	500
9	3	29.79	40.2956	404	7.61	11.89	1.01	7.92	6.56	16.55	4.00	12.00	999
10	3	4.44	0.7560	20	8.92	11.12	7.05	8.93	11.12	11.61	8.00	11.50	500
11	3	10.86	4.9833	70	12.67	9.01	10.85	12.69	7.51	11.49	11.50	9.50	303
12	3	11.74	3.7466	40	24.59	8.86	22.73	24.61	7.70	11.22	24.00	9.00	500
13	3	6.01	1.9919	18	5.90	8.75	4.89	5.91	7.59	9.62	5.50	9.00	500
14	3	25.69	12.0451	150	22.68	7.49	16.14	22.73	5.48	10.02	20.00	8.00	500
15	3	3.68	0.5464	58	18.64	7.50	17.83	18.66	7.49	8.75	18.40	7.70	PVT
16	3	2.13	0.2953	8	24.60	6.19	24.03	24.61	6.19	6.72	24.50	6.50	500
17	3	62.42	39.6533	371	24.59	5.94	14.48	24.61	1.00	12.06	22.00	6.00	999
18	3	56.26	112.3983	480	16.14	5.49	1.01	17.18	0.97	11.41	9.00	6.00	999
19	3	3.99	0.7279	17	16.13	5.00	14.64	16.14	4.98	5.50	15.50	5.30	500
20	3	3.96	0.9822	14	14.62	3.50	13.64	14.64	3.48	4.51	14.00	4.00	500
21	3	26.15	21.0462	75	24.59	2.22	16.72	24.61	1.00	5.52	21.00	3.00	500
22	3	6.04	1.0945	24	16.20	1.55	14.18	16.21	1.00	2.06	15.50	1.80	500
23	3	6.17	2.2307	20	24.59	1.03	22.69	24.61	1.01	2.22	23.50	1.50	PVT

NUMBER OF ITEMS (EXCLUDING PERIMETER POLYGON) 22

TOTAL NUMBER OF POINTS 3313

TOTAL AREA (SQ. IN.) 409.3754

TOTAL AREA (ACRES) 65500

TOTAL LINE LENGTH (INCHES) 357.60

ST.JOE MAP 113 LAND USE

CHART 08 FEB 80 09:24:14 1 3

ITEM	LABEL LOCATION		LINE LENGTH (FEET)	AREA (ACRES)	LABEL
2	24.50	17.60	6562	50	500
3	3.70	15.50	2807	7	500
4	23.50	15.50	38422	1090	999
5	14.00	15.00	163775	24207	999
6	24.40	14.00	5429	42	500
7	23.50	12.50	37525	1227	999
8	21.00	12.30	4903	30	500
9	4.00	12.00	78652	6447	999
10	8.00	11.50	11718	121	500
11	11.50	9.50	28660	797	303
12	24.00	9.00	30981	599	500
13	5.50	9.00	15875	319	500
14	20.00	8.00	67832	1927	500
15	18.40	7.70	9713	87	PVT
16	24.50	6.50	5633	47	500
17	22.00	6.00	164797	6345	999
18	9.00	6.00	148530	17984	999
19	15.50	5.30	10530	116	500
20	14.00	4.00	10461	157	500
21	21.00	3.00	69036	3367	500
22	15.50	1.80	15935	175	500
23	23.50	1.50	16293	357	PVT

AGGREGATE AREAS BY LABEL

999	57300
500	6959
303	797
PVT	444
	65500 TOTAL

PLOTTING IS COMPLETED

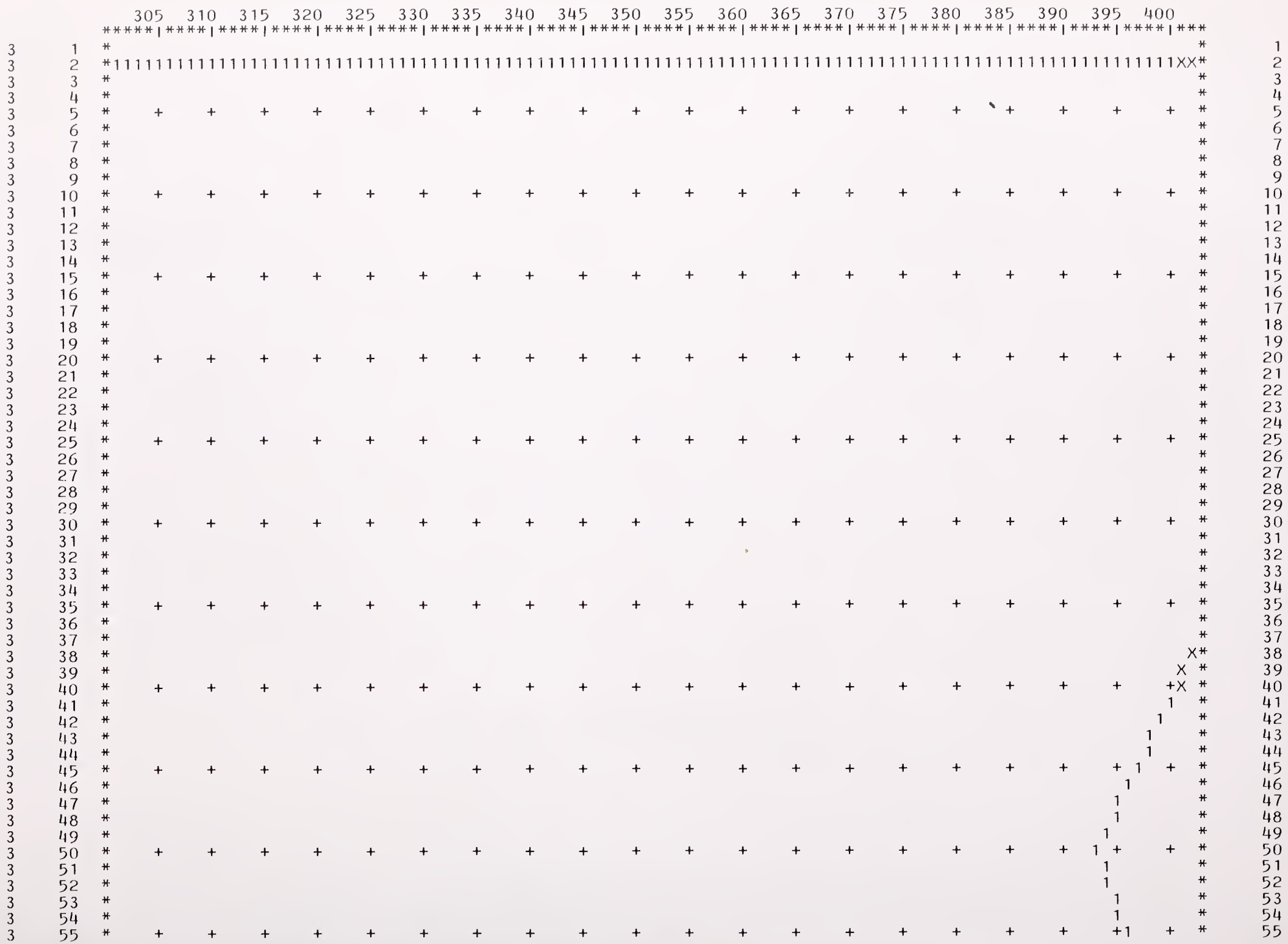
DATE 08 FEB 80 TIME 09:24:14

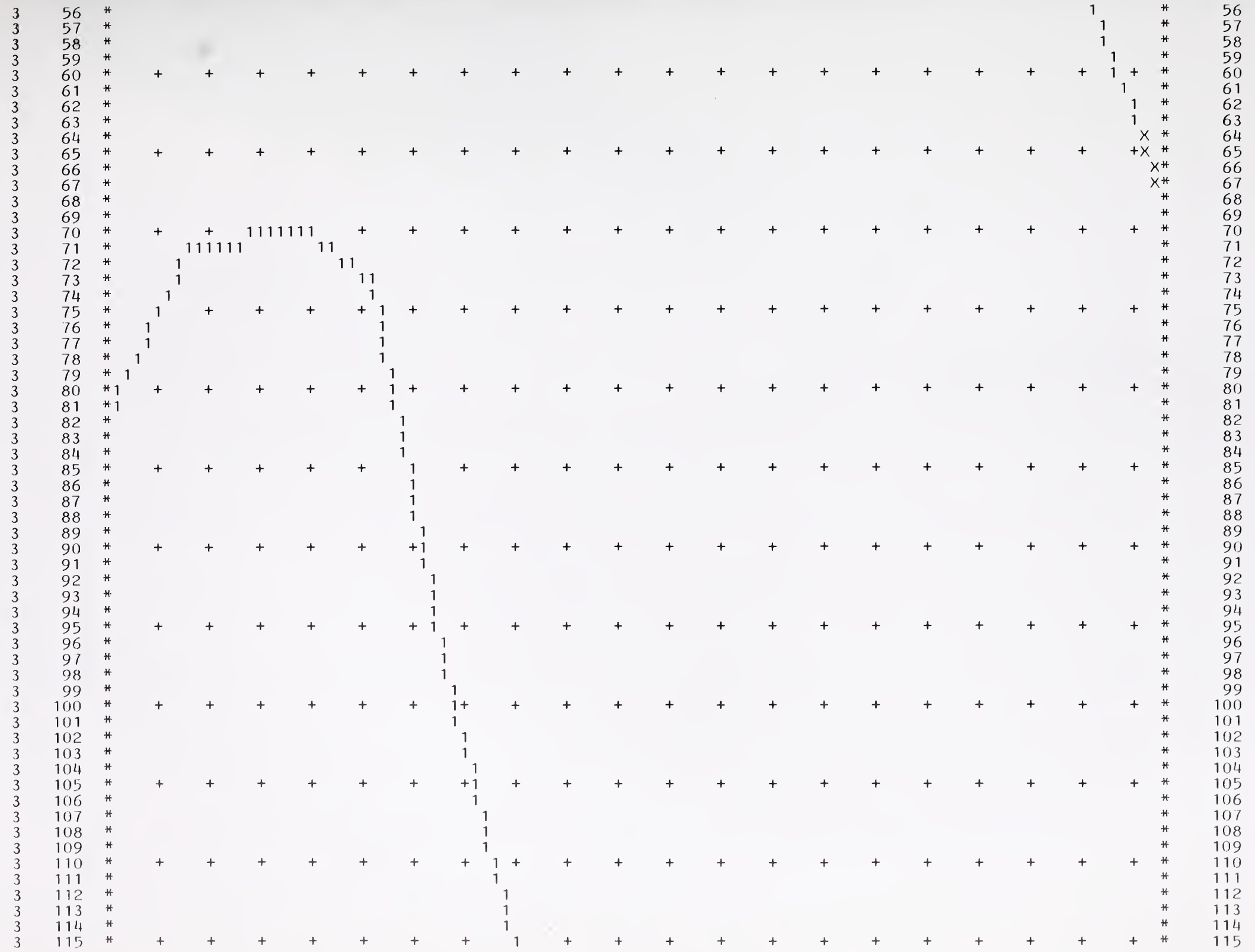
END OF RUN

F.3 HANDY

```
                                                                    HANDY       13 MAR 80  23:23:44    0      1
                        INPUT CARD' FILES: INPUT=WRIS01; OUTPUT=NONE$

INPUT
   REEL WRIS01

OUTPUT
   'NONE'
                        INPUT CARD' HEADER: FOREST=ST.JOE;LAYER=LAND USE;MAP=100;
                        INPUT CARD' LOCATION=BUZZARD ROOST$
                        INPUT CARD' OPTIONS: SKIPS=1$
                                                                                    HANDY     0.3772 SEC
                                                                                    HANDY     0.4259 SEC
                                                                                    HANDY    14.3011 SEC
                                                                                    HANDY    29.9914 SEC

THINNING:    6 SECONDS    20 PASSES
                                                                                    HANDY     5.8815 SEC
```

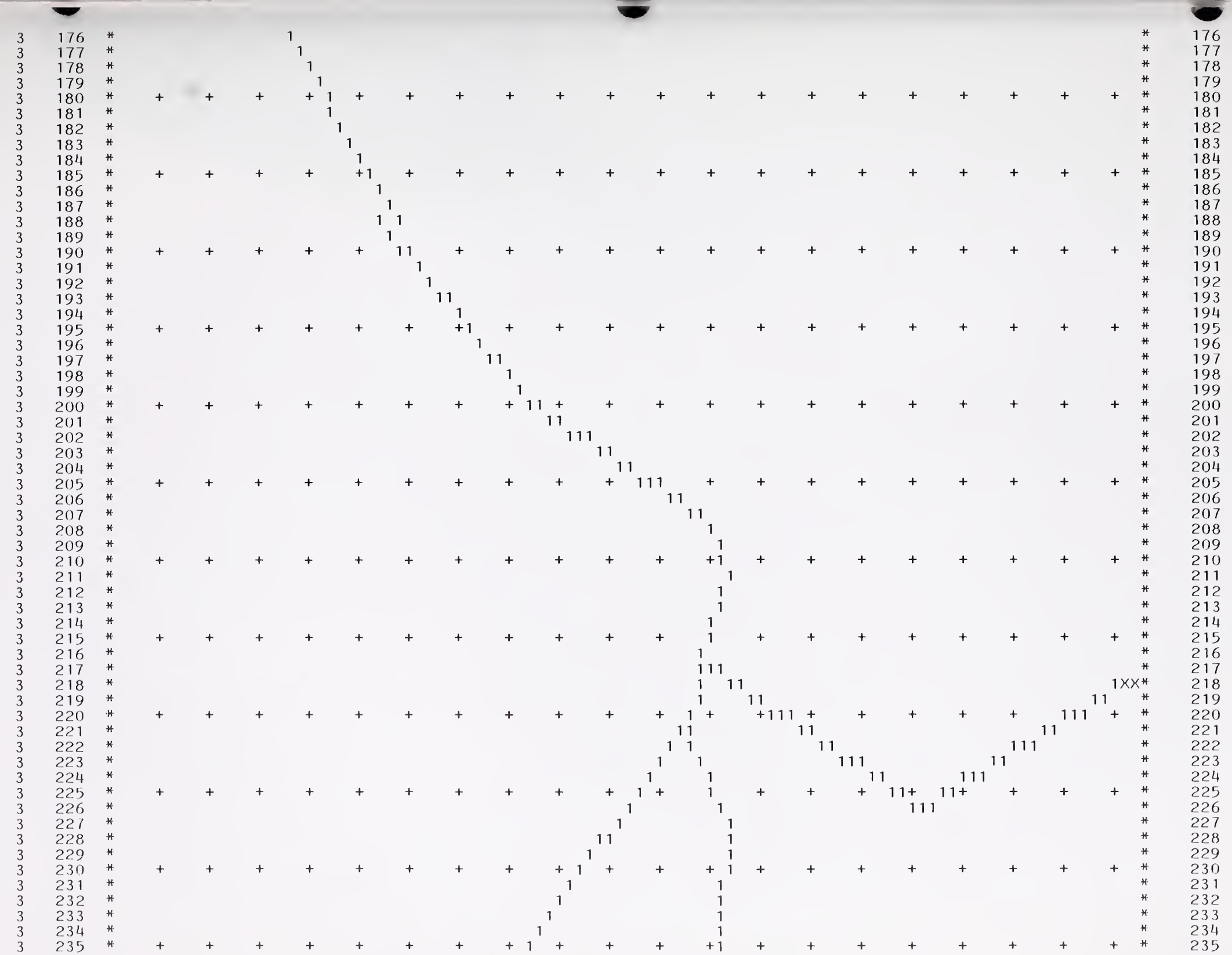
THE FOLLOWING IS A SUBSET OF THE BINARY MAPS PRODUCED BY THE TEST RUN OF "HANDY":



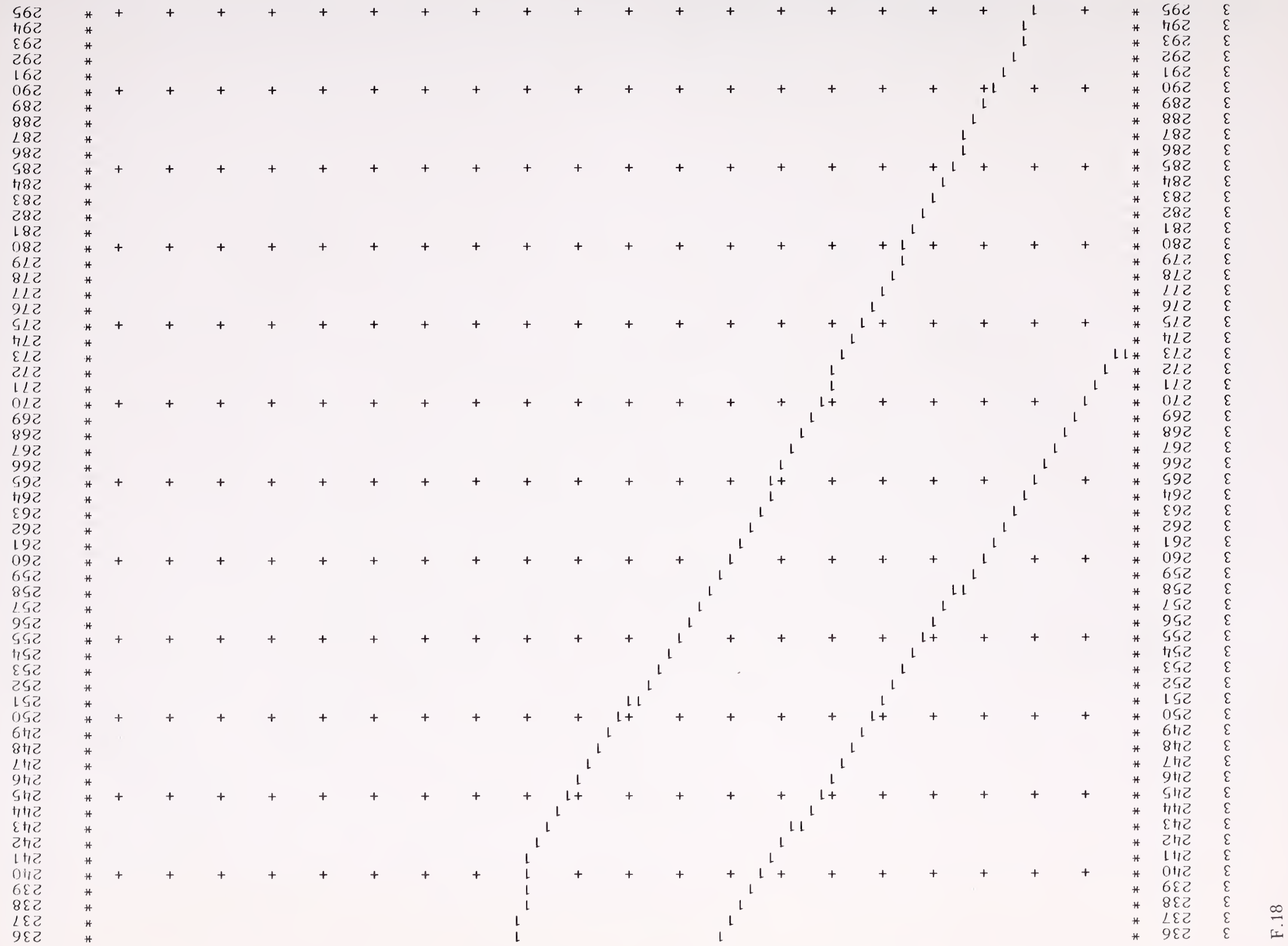


F.15

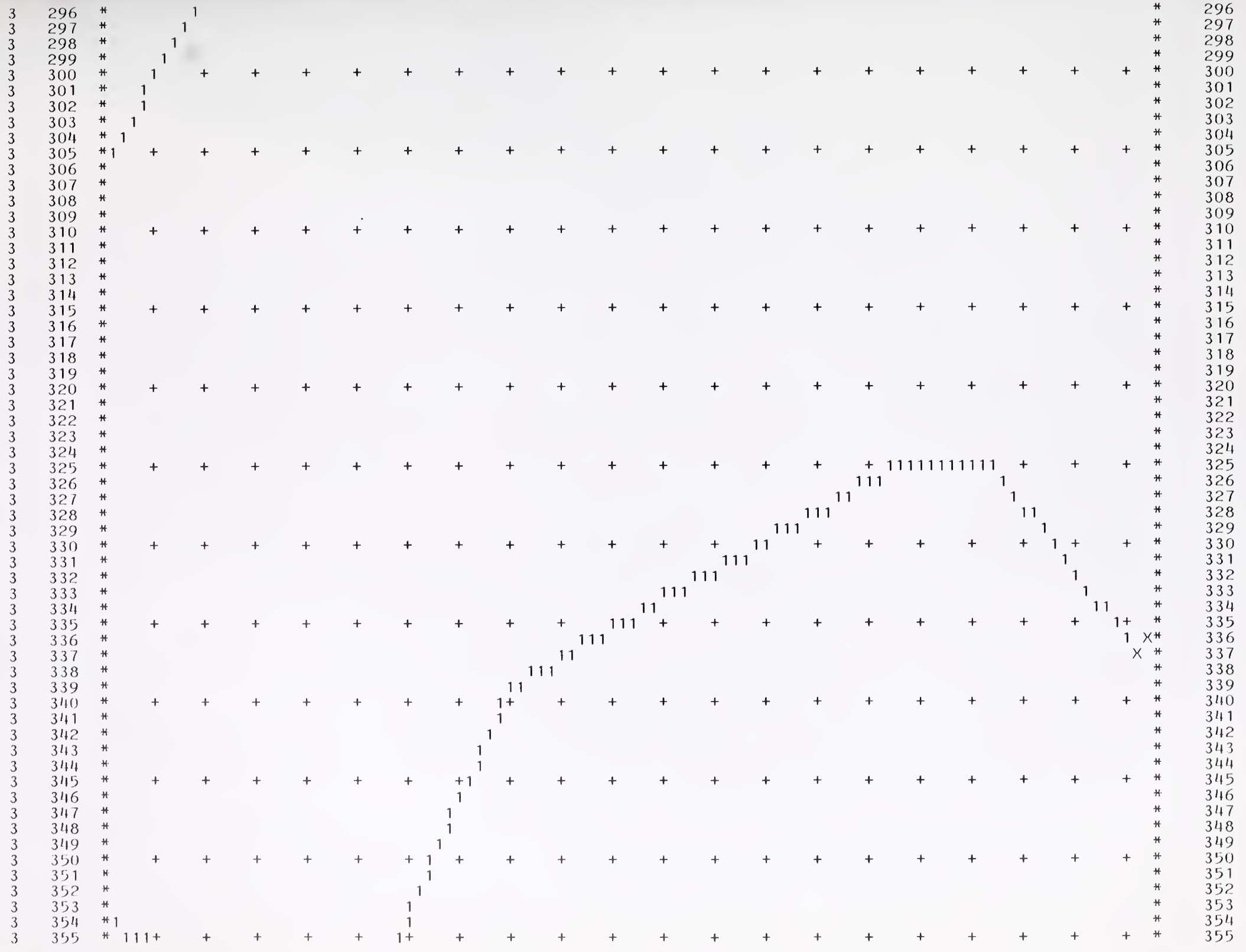
F.16



F.17



F.18



F.19

```
3  356  *    111                    1                                                                          *  356
3  357  *       111                1                                                                           *  357
3  358  *          111             1                                                                           *  358
3  359  *             111         1                                                                            *  359
3  360  *    +    +    + 111+    1    +    +    +    +    +    +    +    +    +    +    +    +    +    +    +  *  360
3  361  *                   111  1                                                                             *  361
3  362  *                      11                                                                              *  362
3  363  *                                                                                                      *  363
3  364  *                                                                                                      *  364
3  365  *    +    +    +    +    +    +    +    +    +    +    +    +    +    +    +    +    +    +    +    +  *  365
3  366  *                                                                                                      *  366
3  367  *                                                                                                      *  367
3  368  *                                                                                                      *  368
3  369  *                                                                                                      *  369
3  370  *    +    +    +    +    +    +    +    +    +    +    +    +    +    +    +    +    +    +    +    +  *  370
       <<<<<<<<<< OMITTING VACANT BLOCK >>>>>>>>>>
3  571  *                                                                                                      *  571
3  572  *                                                                                                      *  572
3  573  *                                                                                                      *  573
3  574  *                                                                                                      *  574
3  575  *    +    +    +    +    +    +    +    +    +    +    +    +    +    +    +    +    +    +    +    +  *  575
3  576  *                                                                                                      *  576
3  577  *                                                                                                      *  577
3  578  *                                                                                                      *  578
3  579  *                                                                                                      *  579
3  580  *1111111111111111111111111111111111111111111111111111111111111111111111111111111111111111111111111111XX*  580
3  581  *                                                                                                      *  581
        *****|****|****|****|****|****|****|****|****|****|****|****|****|****|****|****|****|****|****|****|***
            305  310  315  320  325  330  335  340  345  350  355  360  365  370  375  380  385  390  395  400
```

DATE 13 MAR 80 TIME 23:25:09

END OF RUN

F.4 MERGE

```
                                                                                    MERGE       08 FEB 80  01:34:38     0      1
                                                                                                          MERGE     0.0014 SEC
                                        INPUT CARD' FILES: INPUT ONE=WRIS01; INPUT TWO=WRIS01$


INPUT ONE
   REEL WRIS01


INPUT TWO
   REEL WRIS01
                                        INPUT CARD' HEADER ONE: FOREST=ST.JOE; MAP=59; LAYER=HABITAT$
                                        INPUT CARD' OPTIONS: SKIPS=3$
                                        INPUT CARD' HEADER TWO: FOREST=ST.JOE; MAP=113; LAYER=LAND USE$

PREPARING TO READ INPUT FILE FROM  REEL WRIS01
   POSITION 4   ST.JOE  HABITAT  MAP 59  TENSED   14 AUG 79  20:49:23    8086 WORDS  .101 SECONDS

NUMBER OF POLYGONS: 73   NUMBER OF X-Y POINTS: 7257   AVERAGE NUMBER OF X-Y POINTS PER POLYGON: 99

HEADER RECORD
   FOREST = ST.JOE;   MAP = 59;   LAYER = HABITAT;   LOCATION = TENSED;   SCALE = 31680;
   GEOGRAPHIC CONTROL POINTS = 47.00000, 117.0000, 47.12500, 117.0000, 47.12500, 116.7500, 47.00000, 116.7500;
   MAP CONTROL POINTS = 101, 117, 102, 1857, 2460, 1831, 2463, 101;   GRID CONTROL POINTS = 39, 33, 25, 876, 1164, 892, 1180, 54;
   ZONE = 3;   STATE = IDAHO;   SCAN ROWS = 1283;   SCAN COLUMNS = 928;   MODE = 2;   ENVELOPE = 98, 98, 1850, 2465;
   DATE WRITTEN = 14 AUG 79;   TIME WRITTEN = 20:49:23;   REEL NUMBER = C10598;   POSITION ON REEL = 2

LABELS
   1 PERIMETER   4 570
   2 530         5 520
   3 999

                                        INPUT CARD' OPTIONS: SKIPS=3$
                                        INPUT CARD' OUTPUT HEADER: FOREST=ST.JOE;LAYER=LAND USE;MAP=113$

PREPARING TO READ INPUT FILE FROM  REEL WRIS01
   POSITION 4   ST.JOE  HABITAT  MAP 59  TENSED   14 AUG 79  20:49:23    8086 WORDS  .078 SECONDS     (SKIPPED)
   POSITION 5   ST.JOE  LAND USE  MAP 113  TENSED   02 MAY 78  23:59:38    3829 WORDS  .126 SECONDS

NUMBER OF POLYGONS: 23   NUMBER OF X-Y POINTS: 3502   AVERAGE NUMBER OF X-Y POINTS PER POLYGON: 152

HEADER RECORD
   FOREST = ST.JOE;   MAP = 113;   LAYER = LAND USE;   LOCATION = TENSED;   SCALE = 31680;
   GEOGRAPHIC CONTROL POINTS = 47.00000, 117.0000, 47.12500, 117.0000, 47.12500, 116.7500, 47.00000, 116.7500;
   MAP CONTROL POINTS = 100, 100, 105, 1840, 2460, 1835, 2460, 100;   GRID CONTROL POINTS = 917, 45, 36, 28, 19, 1226, 895, 1243;
   ZONE = 3;   STATE = IDAHO;   SCAN ROWS = 943;   SCAN COLUMNS = 1312;   MODE = 2;   ENVELOPE = 101, 97, 2462, 1840;
   DATE WRITTEN = 02 MAY 78;   TIME WRITTEN = 23:59:38;   REEL NUMBER = CC6938

LABELS
   1 PERIMETER   4 303
   2 999         5 PVT
   3 500

                                                                                                MERGE     2.6317 SEC

OUTPUT HEADER
   FOREST = ST.JOE;   MAP = 113;   LAYER = LAND USE;   LOCATION = TENSED;   SCALE = 31680;
   GEOGRAPHIC CONTROL POINTS = 47.00000, 117.0000, 47.12500, 117.0000, 47.12500, 116.7500, 47.00000, 116.7500;
```

```
ST.JOE  MAP 59  HABITAT          ST.JOE  MAP 113  LAND USE                                                    MERGE      08 FEB 80  01:35:25    2      2
   MAP CONTROL POINTS = 101, 117, 102, 1857, 2460, 1831, 2463, 101;   GRID CONTROL POINTS = 39, 33, 25, 876, 1164, 892, 1180, 54;
   ZONE = 3;   STATE = IDAHO;   SCAN ROWS = 1283;   SCAN COLUMNS = 928;   MODE = 2;   ENVELOPE = 98, 98, 1850, 2465;
   DATE WRITTEN = 14 AUG 79;   TIME WRITTEN = 20:49:23;   REEL NUMBER = C10598;   POSITION ON REEL = 2
                                                                                                  MERGE     0.0570 SEC
                                                                                                  MERGE     0.1518 SEC
                                                                                                  MERGE     0.1114 SEC
```

ITEM	LABEL LOCATION		LINE LENGTH (FEET)	AREA (ACRES)	LABEL
1	13.46	0.20	218100	65511	PERIMETER
2	24.35	17.60	6641	49	530
3	3.71	15.67	3013	8	530
4	14.87	14.17	321737	31708	999
5	24.36	13.92	5364	42	530
6	23.24	12.28	37471	1218	999
7	21.04	12.24	4800	29	530
8	8.66	11.46	5711	44	530
9	8.04	11.46	6906	54	520
10	7.50	11.40	5301	30	530
11	3.39	11.38	78542	6465	999
12	23.38	10.70	27981	457	570
13	11.25	10.66	13002	188	530
14	12.09	10.14	19204	91	520
15	11.54	9.99	8301	51	570
16	22.05	9.74	9225	92	530
17	11.38	9.36	13595	180	530
18	18.99	8.92	6424	38	530
19	20.01	8.78	47607	705	570
20	21.86	8.76	5127	18	530
21	5.36	8.70	15911	320	570
22	11.45	8.65	7483	49	570
23	23.81	8.61	12244	97	530
24	22.30	8.59	4597	15	530
25	21.46	8.58	5074	18	530
26	22.55	8.48	13957	95	570
27	21.71	8.46	7294	47	570
28	23.33	8.40	5791	48	570
29	12.02	8.22	8054	42	570
30	11.21	8.07	21441	196	530
31	19.15	8.06	10734	68	530
32	22.10	7.98	14272	59	520
33	22.31	7.64	10269	81	530
34	19.12	7.61	7923	82	570
35	18.59	7.39	6361	30	530
36	20.35	7.38	27151	131	520
37	20.20	7.10	5998	33	530
38	18.24	7.07	12429	135	570
39	17.55	6.89	8540	57	530
40	24.31	6.47	5585	46	570
41	17.40	6.41	10914	80	570
42	16.90	5.90	11675	143	530
43	15.33	5.25	10573	120	530
44	19.93	4.99	50487	574	570
45	18.95	4.96	6820	49	530
46	8.92	4.86	148707	17979	999
47	14.07	4.41	5353	31	570
48	20.20	4.28	45980	340	520
49	14.53	4.22	3928	17	570
50	13.81	4.10	5830	34	530
51	14.13	4.04	11994	45	520
52	23.18	3.80	11882	107	530
53	14.49	3.76	4412	23	530
54	14.09	3.68	2886	11	530

ITEM	LABEL LOCATION		LINE LENGTH (FEET)	AREA (ACRES)	LABEL
55	18.08	3.42	4529	16	570
56	19.34	3.38	6463	33	570
57	17.61	3.31	7447	46	530
58	23.70	3.27	11196	84	530
59	17.13	3.14	7884	61	570
60	24.25	3.06	39909	440	570
61	21.64	3.02	11865	109	530
62	19.92	2.80	6919	35	570
63	16.97	2.78	7145	52	530
64	23.67	2.38	5123	35	520
65	20.35	2.38	7307	52	570
66	24.55	2.32	2694	8	530
67	23.30	2.24	1277	2	570
68	18.18	2.08	18499	261	570
69	21.83	2.06	13785	142	530
70	15.04	1.70	15874	176	570
71	23.66	1.60	16380	359	999
72	19.79	1.58	46013	761	530
73	22.27	1.49	11912	170	570
74	24.50	17.60	6562	50	500
75	3.70	15.50	2807	7	500
76	23.50	15.50	38422	1090	999
77	14.00	15.00	163775	24207	999
78	24.40	14.00	5429	42	500
79	23.50	12.50	37525	1227	999
80	21.00	12.30	4903	30	500
81	4.00	12.00	78652	6447	999
82	8.00	11.50	11718	121	500
83	11.50	9.50	28660	797	303
84	24.00	9.00	30981	599	500
85	5.50	9.00	15875	319	500
86	20.00	8.00	67832	1927	500
87	18.40	7.70	9713	87	PVT
88	24.50	6.50	5633	47	500
89	22.00	6.00	164797	6345	999
90	9.00	6.00	148530	17984	999
91	15.50	5.30	10530	116	500
92	14.00	4.00	10461	157	500
93	21.00	3.00	69036	3367	500
94	15.50	1.80	15935	175	500
95	23.50	1.50	16293	357	PVT

AGGREGATE AREAS BY LABEL

PERIMETER	65511
530	3000
999	115029
570	4024
520	755
500	6959

ST.JOE MAP 59 HABITAT
AGGREGATE AREAS BY LABEL

ST.JOE MAP 113 LAND USE

MERGE 08 FEB 80 01:35:27 3 5

303 797
PVT 444

196519 TOTAL

MERGE 0.2461 SEC

DATE 08 FEB 80 TIME 01:35:27

END OF RUN

F.5 MOSAIC

```
                                                                                MOSAIC      11 MAR 80  18:29:40     0      1
                                                                                                    MOSAIC    0.0018 SEC
                                    INPUT CARD' FILES: INPUT ONE=WRIS01; INPUT TWO=WRIS01; OUTPUT=NONE$


INPUT ONE
   REEL WRIS01


INPUT TWO
   REEL WRIS01


OUTPUT
   'NONE'
                                    INPUT CARD' HEADER ONE: FOREST=ST.JOE; MAP=59; LAYER=HABITAT;
                                    INPUT CARD' STATE=IDAHO;ZONE=3$
                                    INPUT CARD' OPTIONS: SKIPS=3$
                                    INPUT CARD' HEADER TWO: FOREST=ST.JOE; MAP=113; LAYER=LAND USE;

PREPARING TO READ INPUT FILE FROM  REEL WRIS01
   POSITION 4   ST.JOE  HABITAT  MAP 59  TENSED   14 AUG 79  20:49:23    8086 WORDS  .108 SECONDS

NUMBER OF POLYGONS: 73   NUMBER OF X-Y POINTS: 7257   AVERAGE NUMBER OF X-Y POINTS PER POLYGON: 99

HEADER RECORD
   FOREST = ST.JOE;   MAP = 59;   LAYER = HABITAT;   LOCATION = TENSED;   SCALE = 31680;
   GEOGRAPHIC CONTROL POINTS = 47.00000, 117.0000, 47.12500, 117.0000, 47.12500, 116.7500, 47.00000, 116.7500;
   MAP CONTROL POINTS = 101, 117, 102, 1857, 2460, 1831, 2463, 101;   GRID CONTROL POINTS = 39, 33, 25, 876, 1164, 892, 1180, 54;
   ZONE = 3;   STATE = IDAHO;   SCAN ROWS = 1283;   SCAN COLUMNS = 928;   MODE = 2;   ENVELOPE = 98, 98, 1850, 2465;
   DATE WRITTEN = 14 AUG 79;   TIME WRITTEN = 20:49:23;   REEL NUMBER = C10598;   POSITION ON REEL = 2

LABELS
   1 PERIMETER   4 570
   2 530         5 520
   3 999

                                    INPUT CARD' STATE=IDAHO;ZONE=3$
                                    INPUT CARD' OPTIONS: SKIPS=3$
                                    INPUT CARD' POLYGON SELECTIONS: INCLUDE AREAS GREATER THAN=5.09$

PREPARING TO READ INPUT FILE FROM  REEL WRIS01
   POSITION 4   ST.JOE  HABITAT  MAP 59  TENSED   14 AUG 79  20:49:23    8086 WORDS  .091 SECONDS     (SKIPPED)
   POSITION 5   ST.JOE  LAND USE  MAP 113  TENSED   02 MAY 78  23:59:38    3829 WORDS  .136 SECONDS

NUMBER OF POLYGONS: 23   NUMBER OF X-Y POINTS: 3502   AVERAGE NUMBER OF X-Y POINTS PER POLYGON: 152

HEADER RECORD
   FOREST = ST.JOE;   MAP = 113;   LAYER = LAND USE;   LOCATION = TENSED;   SCALE = 31680;
   GEOGRAPHIC CONTROL POINTS = 47.00000, 117.0000, 47.12500, 117.0000, 47.12500, 116.7500, 47.00000, 116.7500;
   MAP CONTROL POINTS = 100, 100, 105, 1840, 2460, 1835, 2460, 100;   GRID CONTROL POINTS = 917, 45, 36, 28, 19, 1226, 895, 1243;
   ZONE = 3;   STATE = IDAHO;   SCAN ROWS = 943;   SCAN COLUMNS = 1312;   MODE = 2;   ENVELOPE = 101, 97, 2462, 1840;
   DATE WRITTEN = 02 MAY 78;   TIME WRITTEN = 23:59:38;   REEL NUMBER = CC6938
```

```
ST.JOE  MAP 59  HABITAT          ST.JOE  MAP 113  LAND USE                        MOSAIC     11 MAR 80  18:31:32    2     2
LABELS
   1 PERIMETER    4 303
   2 999          5 PVT
   3 500

                               INPUT CARD' OUTPUT HEADER: FOREST=ST.JOE;LAYER=HABITAT/LAND USE;MAP=113;
                               INPUT CARD' LOCATION=TENSED;
                               INPUT CARD' STATE=IDAHO; ZONE=3$
                               INPUT CARD' MOSAIC OPTIONS: MINIMUM INPUT POLYGON AREA=2.0;
                               INPUT CARD'                 MINIMUM OUTPUT POLYGON AREA=1.0;
                               INPUT CARD'                 MINIMUM GROUND SLIVER WIDTH=150.0$

MAP 1 TO NEW MAP TRANSFORMATION:  X'=-.9847+1.0002*X+.0149*Y,  Y'=-.8155-.0055*X+.9953*Y

MAP 2 TO NEW MAP TRANSFORMATION:  X'=-.9734+1.0011*X+.0128*Y,  Y'=-.6246-.0133*X+.9939*Y

NEW MAP TO MAP 1 TRANSFORMATION:  X'=.9723+.9998*X-.0150*Y,  Y'=.8248+.0056*X+1.0047*Y

NEW MAP TO MAP 2 TRANSFORMATION:  X'=.9641+.9987*X-.0129*Y,  Y'=.6414+.0134*X+1.0060*Y
                                                                                         MOSAIC   4.6894 SEC

MINIMUM INPUT POLYGON AREA = 2.00 ACRES.

MINIMUM OUTPUT POLYGON AREA = 1.00 ACRES.

MINIMUM GROUND SLIVER WIDTH = 150.00 FEET.

MINIMUM MAP SLIVER WIDTH = .06 INCHES.
                                                                                         MOSAIC   1.0609 SEC

HABITAT

530   3000
999  57730
570   4024
520    755

   65509 TOTAL


LAND USE

999  57300
500   6959
303    797
PVT    444

   65500 TOTAL
                                                                                         MOSAIC   0.0566 SEC


 FIRST SECOND                                                       OUTPUT                                      CUMUL.
 INPUT  INPUT  MINX  MINY  MAXX  MAXY  ACRES  LABEL                   ITEM  MINX  MINY  MAXX  MAXY  ACRES  ACRES
```

ST.JOE	MAP 59	HABITAT			ST.JOE	MAP 113	LAND USE
2		2348	1612	2391	1707	49	530
	2	2350	1613	2390	1706	50	500
3		287	1444	306	1487	8	530
	3	286	1443	304	1485	7	500
4		27	13	2389	1766	31708	999
	4	2024	1155	2388	1655	1090	999
	5	28	615	2388	1764	24207	999
	15	1697	658	1782	782	87	PVT
	17	1357	13	2376	1107	6345	999
5		2331	1267	2384	1319	42	530
	6	2331	1269	2385	1320	42	500
6		2044	872	2384	1315	1218	999
	7	2045	873	2384	1316	1227	999
7		1994	1108	2046	1157	29	530
	8	1992	1107	2046	1157	30	500
8		748	1030	813	1081	44	530
	10	623	1031	812	1081	121	500
9		672	1032	765	1083	54	520
	10	623	1031	812	1081	121	500
10		622	1035	700	1075	30	530
	10	623	1031	812	1081	121	500
11		13	589	709	1583	6465	999
	9	14	588	711	1581	6447	999
12		2191	669	2378	1022	457	570
	12	2191	670	2379	1021	599	500
13		1002	894	1113	1066	188	530
	11	999	668	1186	1065	797	303
14		1042	849	1185	1061	91	520
	11	999	668	1186	1065	797	303
15		1005	863	1112	931	51	570
	11	999	668	1186	1065	797	303
16		2056	853	2191	905	92	530
	14	1525	461	2191	905	1927	500
17		1001	766	1119	919	180	530
	11	999	668	1186	1065	797	303
18		1789	743	1850	822	38	530
	14	1525	461	2191	905	1927	500
19		1781	651	2088	907	705	570
	14	1525	461	2191	905	1927	500

MOSAIC 11 MAR 80 18:31:38 5 3

1	2350	1613	2390	1706	46	46
2	287	1445	304	1485	6	6
3	2024	1156	2387	1655	1082	1082
4	28	615	2388	1764	24023	25105
5	1697	659	1782	782	85	25190
6	1358	13	2375	1107	6264	31454
7	2331	1269	2384	1319	38	38
8	2045	873	2384	1315	1205	1205
9	1994	1108	2046	1157	28	28
10	749	1031	812	1080	40	40
11	672	1032	765	1081	50	50
12	623	1035	700	1075	29	29
13	14	589	709	1581	6388	6388
14	2191	670	2378	1021	445	445
15	1003	894	1113	1064	185	185
16	1042	849	1185	1061	84	84
17	1005	863	1112	931	50	50
18	2056	854	2191	904	90	90
19	1001	766	1119	919	179	179
20	1789	743	1850	822	39	39
21	1781	651	2088	905	695	695

F.30

ST.JOE MAP 59 HABITAT — ST.JOE MAP 113 LAND USE

FIRST INPUT	SECOND INPUT	MINX	MINY	MAXX	MAXY	ACRES	LABEL
20		2091	722	2118	803	18	530
	14	1525	461	2191	905	1927	500
21		404	688	508	889	320	570
	13	404	686	507	885	319	500
22		1015	747	1119	819	49	570
	11	999	668	1186	1065	797	303
23		2269	669	2359	822	97	530
	12	2191	670	2379	1021	599	500
24		2133	721	2158	785	15	530
	14	1525	461	2191	905	1927	500
25		2054	726	2073	804	18	530
	14	1525	461	2191	905	1927	500
26		2106	701	2187	803	95	570
	14	1525	461	2191	905	1927	500
27		2067	704	2114	805	47	570
	14	1525	461	2191	905	1927	500
28		2219	721	2278	773	48	570
	12	2191	670	2379	1021	599	500
29		1052	669	1131	761	42	570
	11	999	668	1186	1065	797	303
30		1000	671	1184	916	196	530
	11	999	668	1186	1065	797	303
31		1781	624	1892	736	68	530
	14	1525	461	2191	905	1927	500
32		1994	655	2186	726	59	520
	14	1525	461	2191	905	1927	500
33		2025	652	2186	696	81	530
	14	1525	461	2191	905	1927	500
34		1780	621	1870	705	82	570
	14	1525	461	2191	905	1927	500
35		1739	617	1835	663	30	530
	14	1525	461	2191	905	1927	500
36		1833	606	1997	848	131	520
	14	1525	461	2191	905	1927	500
37		1889	605	1981	632	33	530
	14	1525	461	2191	905	1927	500
38		1667	558	1833	659	135	570
	14	1525	461	2191	905	1927	500

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OUTPUT ITEM	MINX	MINY	MAXX	MAXY	ACRES	CUMUL. ACRES
22	2091	722	2118	803	18	18
23	404	688	507	885	308	308
24	1015	747	1119	819	48	48
25	2269	671	2359	822	94	94
26	2133	721	2158	785	14	14
27	2054	726	2073	804	17	17
28	2106	701	2187	803	94	94
29	2067	704	2114	804	46	46
30	2219	721	2278	772	45	45
31	1052	669	1130	761	38	38
32	1000	671	1184	916	194	194
33	1781	624	1892	736	68	68
34	1994	655	2185	726	59	59
35	2025	652	2184	696	81	81
36	1780	621	1870	705	80	80
37	1739	617	1835	663	29	29
38	1833	607	1997	848	130	130
39	1889	605	1981	632	31	31
40	1667	561	1833	659	131	131

ST.JOE MAP 59 HABITAT ST.JOE MAP 113 LAND USE

FIRST INPUT	SECOND INPUT	MINX	MINY	MAXX	MAXY	ACRES	LABEL
39		1627	559	1728	644	57	530
	14	1525	461	2191	905	1927	500
40		2317	521	2373	574	46	570
	16	2316	520	2375	573	47	500
41		1579	468	1689	591	80	570
	14	1525	461	2191	905	1927	500
42		1526	460	1673	555	143	530
	14	1525	461	2191	905	1927	500
43		1375	411	1526	465	120	530
	19	1376	413	1525	463	116	500
44		1774	198	2209	460	574	570
	21	1581	10	2370	458	3367	500
45		1777	363	1853	440	49	530
	21	1581	10	2370	458	3367	500
46		4	16	1630	1060	17979	999
	18	5	18	1632	1060	17984	999
47		1277	329	1353	366	31	570
	20	1273	266	1372	368	157	500
48		1672	8	2077	367	340	520
	21	1581	10	2370	458	3367	500
49		1346	302	1374	360	17	570
	20	1273	266	1372	368	157	500
50		1275	266	1312	343	34	530
	20	1273	266	1372	368	157	500
51		1292	265	1374	365	45	520
	20	1273	266	1372	368	157	500
52		2180	183	2298	325	107	530
	21	1581	10	2370	458	3367	500
53		1333	265	1375	317	23	530
	20	1273	266	1372	368	157	500
54		1302	265	1331	299	11	530
	20	1273	266	1372	368	157	500
55		1675	239	1749	261	16	570
	21	1581	10	2370	458	3367	500
56		1825	181	1865	282	33	570
	21	1581	10	2370	458	3367	500
57		1600	207	1712	262	46	530
	21	1581	10	2370	458	3367	500

OUTPUT ITEM	MINX	MINY	MAXX	MAXY	ACRES	CUMUL. ACRES
41	1630	561	1728	635	52	52
42	2317	521	2373	573	43	43
43	1580	468	1689	591	77	77
44	1526	461	1673	555	139	139
45	1376	413	1525	463	112	112
46	1774	198	2208	458	556	556
47	1777	363	1853	440	47	47
48	5	18	1629	1060	17835	17835
49	1277	329	1353	366	29	29
50	1672	11	2077	367	338	338
51	1346	303	1372	359	14	14
52	1275	268	1312	343	32	32
53	1292	266	1372	363	43	43
54	2180	183	2298	323	103	103
55	1333	266	1371	317	21	21
56	1302	267	1331	299	10	10
57	1675	239	1749	260	13	13
58	1825	181	1865	282	33	33
59	1600	207	1712	261	45	45

ST.JOE MAP 59 HABITAT ST.JOE MAP 113 LAND USE

FIRST INPUT	SECOND INPUT	MINX	MINY	MAXX	MAXY	ACRES	LABEL
58		2214	153	2316	320	84	530
	21	1581	10	2370	458	3367	500
59		1581	189	1685	261	61	570
	21	1581	10	2370	458	3367	500
60		2005	124	2370	320	440	570
	21	1581	10	2370	458	3367	500
61		1981	178	2178	232	109	530
	21	1581	10	2370	458	3367	500
62		1873	137	1931	237	35	570
	21	1581	10	2370	458	3367	500
63		1582	168	1674	223	52	530
	21	1581	10	2370	458	3367	500
64		2234	124	2302	164	35	520
	21	1581	10	2370	458	3367	500
65		1881	113	1985	174	52	570
	21	1581	10	2370	458	3367	500
66		2352	125	2368	164	8	530
	21	1581	10	2370	458	3367	500
68		1679	12	1813	214	261	570
	21	1581	10	2370	458	3367	500
69		2022	65	2234	152	142	530
	21	1581	10	2370	458	3367	500
70		1329	16	1528	121	176	570
	22	1324	19	1528	120	175	500
71		2178	5	2368	128	359	999
	23	2176	7	2367	125	357	PVT
72		1745	9	2026	334	761	530
	21	1581	10	2370	458	3367	500
73		2043	7	2181	125	170	570
	21	1581	10	2370	458	3367	500

OVERLAY DOES NOT INCLUDE 93 SPLINTER POLYGONS COMPRISING 159 ACRES

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OUTPUT ITEM	MINX	MINY	MAXX	MAXY	ACRES	CUMUL. ACRES
60	2214	153	2316	320	86	86
61	1582	189	1685	261	59	59
62	2005	125	2370	320	433	433
63	1981	178	2178	232	109	109
64	1873	137	1931	237	34	34
65	1582	168	1674	223	50	50
66	2234	125	2302	164	34	34
67	1881	113	1985	174	52	52
68	2352	125	2367	163	6	6
69	1679	12	1813	214	260	260
70	2022	65	2234	152	140	140
71	1340	19	1527	120	165	165
72	2178	7	2367	125	348	348
73	1745	11	2026	334	753	753
74	2043	10	2178	125	164	164

MOSAIC 5.8445 SEC

ACREAGES

	999	500	303	PVT
530		2375	558	
999	56797			433
570		3776	135	
520		654	84	

ROW SUMS

530	2933
999	57230
570	3911
520	738

64812 TOTAL

COLUMN SUMS

999	56797
500	6805
303	777
PVT	433

64812 TOTAL

ST.JOE MAP 59 HABITAT ST.JOE MAP 113 LAND USE MOSAIC 11 MAR 80 18:31:48 11 8
DATE 11 MAR 80 TIME 18:31:48

END OF RUN

F.6 PGRID

```
                                                                                                    PGRID       15 FEB 80   10:32:23     0       1
                                        INPUT CARD' FILES:  INPUT=WRIS01$


INPUT
   REEL WRIS01
                                        INPUT CARD' HEADER: FOREST=ST.JOE; MAP=59; LAYER=HABITAT$
                                        INPUT CARD' OPTIONS: SKIPS=3$
                                        INPUT CARD' POLYGON SELECTIONS:

PREPARING TO READ INPUT FILE FROM  REEL WRIS01
   POSITION 4    ST.JOE  HABITAT  MAP 59  TENSED    14 AUG 79  20:49:23     8086 WORDS  .106 SECONDS

NUMBER OF POLYGONS: 73    NUMBER OF X-Y POINTS: 7257    AVERAGE NUMBER OF X-Y POINTS PER POLYGON: 99

HEADER RECORD
   FOREST = ST.JOE;    MAP = 59;    LAYER = HABITAT;    LOCATION = TENSED;    SCALE = 31680;
   GEOGRAPHIC CONTROL POINTS = 47.00000, 117.0000, 47.12500, 117.0000, 47.12500, 116.7500, 47.00000, 116.7500;
   MAP CONTROL POINTS = 101, 117, 102, 1857, 2460, 1831, 2463, 101;    GRID CONTROL POINTS = 39, 33, 25, 876, 1164, 892, 1180, 54;
   ZONE = 3;    STATE = IDAHO;    SCAN ROWS = 1283;    SCAN COLUMNS = 928;    MODE = 2;    ENVELOPE = 98, 98, 1850, 2465;
   DATE WRITTEN = 14 AUG 79;    TIME WRITTEN = 20:49:23;    REEL NUMBER = C10598;    POSITION ON REEL = 2

LABELS
   1 PERIMETER    4 570
   2 530          5 520
   3 999

                                        INPUT CARD' INCLUDE ITEMS=2:8$

MAP ENVELOPE:

   LONGITUDE 117.00027 TO 116.81455
   LATITUDE 46.99842 TO 47.17013

OUTPUT FILE LABEL LIST
   1 530
   2 999


PGRID DONE.
384 CARDS REPRESENTING 7 POLYGONS WRITTEN TO FILE  11.
```

DATE 15 FEB 80 TIME 10:33:27

END OF RUN

THE FOLLOWING OUTPUT IS A LIST OF THE RID*GRID "D", "E", AND "F"
RECORDS PRODUCED BY "PGRID".

```
D F-CARDS       10                  G 47.17014 46.99843 117.00027 116.81456
E HABITAT
F 1   1.00000 116.75250  47.12155 116.75250  47.12169 116.75218  47.12184
F   116.75220  47.12198 116.75198  47.12213 116.75197  47.12227 116.75156
F    47.12256 116.75156  47.12271 116.75134  47.12285 116.75134  47.12300
F   116.75092  47.12335 116.74995  47.12329 116.75006  47.12300 116.74976
F    47.12286 116.74998  47.11644 116.75391  47.11650 116.75412  47.11664
F   116.75410  47.11995 116.75378  47.12010 116.75378  47.12024 116.75357
F    47.12039 116.75357  47.12053 116.75314  47.12082 116.75314  47.12097
F   116.75293  47.12111 116.75293  47.12126 116.75250  47.12155
F 1   1.00000 116.97043  47.10527 116.97021  47.10506 116.97043  47.10490
F   116.97043  47.10461 116.97064  47.10448 116.97064  47.10432 116.97084
F    47.10419 116.97095  47.10405 116.97116  47.10390 116.97116  47.10376
F   116.97137  47.10361 116.97137  47.10332 116.97159  47.10318 116.97159
F    47.10274 116.97180  47.10260 116.97180  47.10245 116.97223  47.10216
F   116.97244  47.10229 116.97244  47.10526 116.97043  47.10527
F 1   2.00000 116.84784  47.12492 116.84763  47.12508 116.83055  47.12488
F   116.83035  47.12503 116.81560  47.12482 116.81538  47.12497 116.80002
F    47.12483 116.79980  47.12497 116.79938  47.12491 116.79916  47.12477
F   116.79852  47.12477 116.79820  47.12491 116.78241  47.12471 116.78220
F    47.12485 116.76598  47.12473 116.76575  47.12486 116.75261  47.12471
F   116.75240  47.12486 116.75017  47.12480 116.74995  47.12466 116.74995
F    47.12329 116.75092  47.12335 116.75134  47.12300 116.75134  47.12285
F   116.75156  47.12271 116.75156  47.12256 116.75197  47.12227 116.75198
F    47.12213 116.75220  47.12198 116.75218  47.12184 116.75250  47.12169
F   116.75250  47.12140 116.75272  47.12140 116.75293  47.12126 116.75293
F    47.12111 116.75314  47.12097 116.75314  47.12082 116.75357  47.12053
F   116.75357  47.12039 116.75378  47.12024 116.75378  47.12010 116.75410
F    47.11995 116.75412  47.11664 116.75391  47.11650 116.74998  47.11644
F   116.74998  47.11588 116.74977  47.11572 116.75000  47.10773 116.74980
F    47.10751 116.75003  47.10089 116.74982  47.10066 116.74994  47.09518
F   116.75525  47.09525 116.75566  47.09494 116.75587  47.09494 116.75630
F    47.09465 116.75652  47.09465 116.75694  47.09436 116.75716  47.09436
F   116.75748  47.09422 116.75768  47.09428 116.75810  47.09393 116.75832
F    47.09399 116.75874  47.09370 116.75896  47.09370 116.75917  47.09357
F   116.75938  47.09355 116.75960  47.09341 116.75990  47.09341 116.76033
F    47.09312 116.76054  47.09312 116.76076  47.09297 116.76097  47.09297
F   116.76140  47.09268 116.76161  47.09268 116.76204  47.09239 116.76234
F    47.09239 116.76256  47.09225 116.76277  47.09224 116.76320  47.09195
F   116.76341  47.09195 116.76384  47.09166 116.76405  47.09166 116.76427
F    47.09152 116.76448  47.09152 116.76500  47.09123 116.76521  47.09122
F   116.76564  47.09093 116.76585  47.09093 116.76607  47.09079 116.76628
F    47.09079 116.76671  47.09050 116.76692  47.09050 116.76744  47.09021
F   116.76765  47.09021 116.76787  47.09006 116.76808  47.09006 116.76851
F    47.08977 116.76872  47.08977 116.76894  47.08961 116.76915  47.08961
F   116.76967  47.08932 116.76988  47.08932 116.77010  47.08919 116.77031
F    47.08919 116.77074  47.08890 116.77095  47.08890 116.77116  47.08875
F   116.77138  47.08875 116.77179  47.08846 116.77211  47.08846 116.77232
F    47.08830 116.77254  47.08830 116.77296  47.08801 116.77318  47.08801
F   116.77361  47.08772 116.77382  47.08772 116.77402  47.08759 116.77423
F    47.08759 116.77477  47.08730 116.77498  47.08736 116.77541  47.08699
F   116.77562  47.08707 116.77583  47.08691 116.77605  47.08691 116.77646
F    47.08662 116.77667  47.08662 116.77721  47.08633 116.77742  47.08633
F   116.77763  47.08620 116.77785  47.08618 116.77827  47.08589 116.77849
F    47.08589 116.77890  47.08560 116.77911  47.08560 116.77943  47.08546
F   116.77965  47.08546 116.78008  47.08517 116.78029  47.08517 116.78050
```

F	47.08502	116.78070	47.08502	116.78113	47.08473	116.78134	47.08473
F	116.78166	47.08458	116.78188	47.08458	116.78230	47.08429	116.78252
F	47.08429	116.78273	47.08415	116.78293	47.08415	116.78336	47.08386
F	116.78357	47.08386	116.78378	47.08371	116.78400	47.08371	116.78453
F	47.08342	116.78474	47.08342	116.78494	47.08327	116.78516	47.08327
F	116.78537	47.08313	116.78802	47.08318	116.78824	47.08304	116.78824
F	47.08289	116.78845	47.08275	116.78845	47.08260	116.78867	47.08246
F	116.78867	47.08232	116.78920	47.08195	116.78918	47.08180	116.78940
F	47.08167	116.78941	47.08151	116.78961	47.08138	116.78961	47.08122
F	116.79004	47.08095	116.79004	47.08080	116.79025	47.08064	116.79025
F	47.08051	116.79047	47.08035	116.79047	47.08022	116.79100	47.07993
F	116.79100	47.07964	116.78676	47.07959	116.78654	47.07973	116.78571
F	47.07974	116.78528	47.07938	116.78506	47.07938	116.78485	47.07924
F	116.78464	47.07924	116.78442	47.07910	116.78423	47.07910	116.78380
F	47.07881	116.78348	47.07881	116.78326	47.07867	116.78305	47.07867
F	116.78284	47.07852	116.78264	47.07846	116.78242	47.07831	116.78221
F	47.07831	116.78200	47.07817	116.78178	47.07817	116.78157	47.07803
F	116.78136	47.07803	116.78114	47.07788	116.78093	47.07790	116.78052
F	47.07761	116.78030	47.07761	116.78009	47.07739	116.77988	47.07739
F	116.77966	47.07724	116.77934	47.07726	116.77914	47.07710	116.77893
F	47.07710	116.77872	47.07697	116.77850	47.07697	116.77829	47.07683
F	116.77808	47.07683	116.77766	47.07646	116.77745	47.07646	116.77724
F	47.07632	116.77702	47.07632	116.77681	47.07617	116.77660	47.07619
F	116.77638	47.07603	116.77617	47.07605	116.77576	47.07576	116.77554
F	47.07576	116.77533	47.07561	116.77501	47.07555	116.77480	47.07539
F	116.77458	47.07539	116.77437	47.07526	116.77417	47.07526	116.77396
F	47.07512	116.77374	47.07512	116.77353	47.07497	116.77332	47.07498
F	116.77289	47.07469	116.77269	47.07469	116.77248	47.07448	116.77226
F	47.07448	116.77205	47.07433	116.77184	47.07434	116.77162	47.07419
F	116.77141	47.07419	116.77119	47.07405	116.77100	47.07405	116.77078
F	47.07390	116.77046	47.07391	116.77025	47.07376	116.77003	47.07376
F	116.76961	47.07341	116.76985	47.06642	116.76964	47.06627	116.76349
F	47.06624	116.76328	47.06638	116.76126	47.06631	116.76126	47.06560
F	116.76105	47.06546	116.76128	47.05962	116.76106	47.05948	116.76108
F	47.05919	116.76129	47.05904	116.76129	47.05818	116.76108	47.05803
F	116.76108	47.05753	116.76129	47.05739	116.76140	47.05565	116.76183
F	47.05565	116.76204	47.05551	116.76617	47.05556	116.76669	47.05527
F	116.76671	47.05196	116.76649	47.05180	116.76279	47.05176	116.76257
F	47.05191	116.76173	47.05191	116.76152	47.05176	116.76077	47.05177
F	116.76056	47.05191	116.75601	47.05186	116.75580	47.05171	116.75592
F	47.04840	116.75571	47.04826	116.74998	47.04822	116.75011	47.04332
F	116.74989	47.04318	116.74991	47.04138	116.75011	47.04123	116.75540
F	47.04128	116.75583	47.04099	116.75595	47.03760	116.75002	47.03749
F	116.75002	47.03676	116.74980	47.03662	116.75005	47.02992	116.74983
F	47.02977	116.75006	47.02350	116.74974	47.02336	116.74985	47.02307
F	116.75006	47.02293	116.75705	47.02304	116.75726	47.02289	116.75769
F	47.02289	116.75790	47.02304	116.77039	47.02319	116.77060	47.02304
F	116.77072	47.01814	116.77231	47.01813	116.77252	47.01799	116.78438
F	47.01814	116.78459	47.01801	116.79158	47.01804	116.79178	47.01825
F	116.79178	47.01912	116.79199	47.01926	116.79176	47.02776	116.79198
F	47.02791	116.79185	47.03252	116.79906	47.03255	116.79927	47.03239
F	116.80986	47.03256	116.81006	47.03241	116.81293	47.03247	116.81314
F	47.03232	116.81314	47.02930	116.81293	47.02916	116.81305	47.02563
F	116.81284	47.02548	116.81305	47.02534	116.81316	47.02275	116.81294
F	47.02260	116.81306	47.01799	116.81328	47.01784	116.81348	47.01799
F	116.81433	47.01805	116.81465	47.01791	116.81570	47.01790	116.81592
F	47.01805	116.81836	47.01810	116.81856	47.01796	116.82332	47.01801
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F	116.81775	47.00053	116.81775	47.00009	116.82431	47.00014	116.82452
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F    47.07355 116.75732  47.07362 116.75754  47.07339 116.76939  47.07355
F   116.76961  47.07341 116.77003  47.07376 116.77025  47.07376 116.77046
F    47.07391 116.77078  47.07390 116.77100  47.07405 116.77119  47.07405
F   116.77141  47.07419 116.77162  47.07419 116.77184  47.07434 116.77205
F    47.07433 116.77226  47.07448 116.77248  47.07448 116.77269  47.07469
F   116.77289  47.07469 116.77332  47.07498 116.77353  47.07497 116.77374
F    47.07512 116.77396  47.07512 116.77417  47.07526 116.77437  47.07526
F   116.77458  47.07539 116.77480  47.07539 116.77501  47.07555 116.77533
F    47.07561 116.77554  47.07576 116.77576  47.07576 116.77617  47.07605
F   116.77638  47.07603 116.77660  47.07619 116.77681  47.07617 116.77702
F    47.07632 116.77724  47.07632 116.77745  47.07646 116.77766  47.07646
F   116.77808  47.07683 116.77829  47.07683 116.77850  47.07697 116.77872
F    47.07697 116.77893  47.07710 116.77914  47.07710 116.77934  47.07726
F   116.77966  47.07724 116.77988  47.07739 116.78009  47.07739 116.78030
F    47.07761 116.78052  47.07761 116.78093  47.07790 116.78114  47.07788
F   116.78136  47.07803 116.78157  47.07803 116.78178  47.07817 116.78200
F    47.07817 116.78221  47.07831 116.78242  47.07831 116.78264  47.07846
F   116.78284  47.07852 116.78305  47.07867 116.78326  47.07867 116.78348
F    47.07881 116.78380  47.07881 116.78423  47.07910 116.78442  47.07910
F   116.78464  47.07924 116.78485  47.07924 116.78506  47.07938 116.78528
F    47.07938 116.78571  47.07974 116.78558  47.08313 116.78537  47.08313
F   116.78516  47.08327 116.78494  47.08327 116.78474  47.08342 116.78453
F    47.08342 116.78400  47.08371 116.78378  47.08371 116.78357  47.08386
F   116.78336  47.08386 116.78293  47.08415 116.78273  47.08415 116.78252
F    47.08429 116.78230  47.08429 116.78188  47.08458 116.78166  47.08458
F   116.78134  47.08473 116.78113  47.08473 116.78070  47.08502 116.78050
F    47.08502 116.78029  47.08517 116.78008  47.08517 116.77965  47.08546
F   116.77943  47.08546 116.77911  47.08560 116.77890  47.08560 116.77849
F    47.08589 116.77827  47.08589 116.77785  47.08618 116.77763  47.08620
F   116.77742  47.08633 116.77721  47.08633 116.77667  47.08662 116.77646
```

```
F    47.08662 116.77605  47.08691 116.77583  47.08691 116.77562  47.08707
F   116.77541  47.08699 116.77498  47.08736 116.77477  47.08730 116.77423
F    47.08759 116.77402  47.08759 116.77382  47.08772 116.77361  47.08772
F   116.77318  47.08801 116.77296  47.08801 116.77254  47.08830 116.77232
F    47.08830 116.77211  47.08846 116.77179  47.08846 116.77138  47.08875
F   116.77116  47.08875 116.77095  47.08890 116.77074  47.08890 116.77031
F    47.08919 116.77010  47.08919 116.76988  47.08932 116.76967  47.08932
F   116.76915  47.08961 116.76894  47.08961 116.76872  47.08977 116.76851
F    47.08977 116.76808  47.09006 116.76787  47.09006 116.76765  47.09021
F   116.76744  47.09021 116.76692  47.09050 116.76671  47.09050 116.76628
F    47.09079 116.76607  47.09079 116.76585  47.09093 116.76564  47.09093
F   116.76521  47.09122 116.76500  47.09123 116.76448  47.09152 116.76427
F    47.09152
F 1   1.00000 116.78558  47.08313 116.78571  47.07974 116.78654  47.07973
F   116.78676  47.07959 116.79100  47.07964 116.79100  47.07993 116.79047
F    47.08022 116.79047  47.08035 116.79025  47.08051 116.79025  47.08064
F   116.79004  47.08080 116.79004  47.08095 116.78961  47.08122 116.78961
F    47.08138 116.78941  47.08151 116.78940  47.08167 116.78918  47.08180
F   116.78920  47.08195 116.78867  47.08232 116.78867  47.08246 116.78845
F    47.08260 116.78845  47.08275 116.78824  47.08289 116.78824  47.08304
F   116.78802  47.08318 116.78558  47.08313
F 1   1.00000 116.91656  47.07645 116.91605  47.07610 116.91615  47.07509
F   116.91594  47.07494 116.91615  47.07480 116.91615  47.07285 116.91879
F    47.07291 116.91901  47.07275 116.92059  47.07275 116.92102  47.07303
F   116.92102  47.07332 116.92145  47.07368 116.92145  47.07426 116.92166
F    47.07440 116.92166  47.07454 116.92229  47.07498 116.92229  47.07562
F   116.92250  47.07576 116.92250  47.07591 116.92293  47.07619 116.92293
F    47.07634 116.92271  47.07648 116.91656  47.07645
```

THE FOLLOWING OUTPUT IS A LIST OF THE LABELS PRODUCED BY "PGRID".

530
999

F.7 POLLY

```
                                                                                                POLLY       13 MAR 80  00:48:26     0      1
                                                                                                                      POLLY     0.0013 SEC
                                                INPUT CARD' FILES: INPUT=WRIS01; OUTPUT=NONES


INPUT
   REEL WRIS01


OUTPUT
   'NONE'
                                                INPUT CARD' HEADER: FOREST=ST.JOE; MAP=59; LAYER=HABITAT$
                                                INPUT CARD' OPTIONS: SKIPS=2$
                                                INPUT CARD' HEADER UPDATES: FOREST=ST.JOE; MAP=59; LAYER=HABITAT;
                                                INPUT CARD' LOCATION=TENSED;
                                                INPUT CARD' 'TENSED HABITAT ST.JOE'
                                                INPUT CARD' MAP=059; FOREST=ST.JOE; LAYER=HABITAT; LOCATION=TENSED;
                                                INPUT CARD' MAP CONTROL POINTS= 101,117,102,1857,2460,1831,2463,101;
                                                INPUT CARD' GEOGRAPHIC CONTROL POINTS=47:00:00,117:00:00,47:07:30,117:00:00,
                                                INPUT CARD' 47:07:30,116:45:00,47:00:00,116:45:00;
                                                INPUT CARD' GRID CONTROL POINTS=39,33,25,876,1164,892,1180,54;
                                                INPUT CARD' STATE=IDAHO; ZONE=3; SCALE=31680; ENVELOPE=98,98,1850,2465$
                                                INPUT CARD' CORRECTIONS:

PREPARING TO READ INPUT FILE FROM  REEL WRIS01
   POSITION 3   ST.JOE  HABITAT  MAP 59  TENSED   26 JUL 77  02:10:21    37262 WORDS  1.273 SECONDS

HEADER RECORD
   FOREST = ST.JOE;   MAP = 59;   LAYER = HABITAT;   LOCATION = TENSED;   SCAN ROWS = 1283;   SCAN COLUMNS = 928;   MODE = 0;
   ENVELOPE = 0, 0, 0, 0;   DATE WRITTEN = 26 JUL 77;   TIME WRITTEN = 02:10:21;   REEL NUMBER = CC3902
                                                                                                POLLY     4.7051 SEC

UPDATED HEADER RECORD
   FOREST = ST.JOE;   MAP = 59;   LAYER = HABITAT;   LOCATION = TENSED;   SCALE = 31680;
   GEOGRAPHIC CONTROL POINTS = 47.00000, 117.0000, 47.12500, 117.0000, 47.12500, 116.7500, 47.00000, 116.7500;
   MAP CONTROL POINTS = 101, 117, 102, 1857, 2460, 1831, 2463, 101;   GRID CONTROL POINTS = 39, 33, 25, 876, 1164, 892, 1180, 54;
   ZONE = 3;   STATE = IDAHO;   SCAN ROWS = 1283;   SCAN COLUMNS = 928;   MODE = 2;   ENVELOPE = 98, 98, 1850, 2465;
   DATE WRITTEN = 26 JUL 77;   TIME WRITTEN = 02:10:21;   REEL NUMBER = CC3902


THE MAP SCALE IN THE HEADER RECORD IS 31680THE FOLLOWING TABLE SHOWS MAP SCALES BETWEEN EACH PAIR OF CONTROL POINTS.
THESE SCALES ARE CALCULATED FROM THE GEOGRAPHIC CONTROL POINTS IN THE HEADER RECORD.

                TO POINT 2     TO POINT 3     TO POINT 4

FROM POINT 1         31443          31774          31693

FROM POINT 2                        31672          31488

FROM POINT 3                                       31624


                                                INPUT CARD' ADDS=
                                                INPUT CARD' <1114,116:118>,<32,442:444>,<1172,458:466>,<1174,404:407>,
                                                INPUT CARD' <39,81:83>,<680:691,44>,679,45,<680:684,46>,<1178,157:158>,
                                                INPUT CARD' 1179,152,911,345,<35,286:291>,912,344,302,604,301,605,300,606,
```

INPUT CARD' <298:299,607>,<434:437,881>,<1013:1015,889>,1022,890,
INPUT CARD' <1085:1086,890>,<1092:1093,891>;

/// SORTED ADDITIONS /// 68

ROW	COLUMNS
32	442-444
35	286-291
39	81-83
298-299	607
300	606
301	605
302	604
434-437	881
679	45
680	44 46
681	44 46
682	44 46
683	44 46
684	44 46
685-691	44
911	345
912	344
1013-1015	889
1022	890
1085-1086	890
1092-1093	891
1114	116-118
1172	458-466
1174	404-407
1178	157-158
1179	152

INPUT CARD' DELETES=

```
INPUT CARD' 1107,121,<1108,122:123>,
INPUT CARD' <418,521:522>,
INPUT CARD' 1113,117,<1115,116:118>,
INPUT CARD' <680:684,45>,691,46,890,81,890,83,911,346,912,345,<509:510,453>,
INPUT CARD' 920,403,547,382$
```

/// SORTED DELETIONS /// 23

ROW	COLUMNS
418	521-522
509-510	453
547	382
680-684	45
691	46
890	81 83
911	346
912	345
920	403
1107	121
1108	122-123
1113	117
1115	116-118

```
INPUT CARD' LABELS: LIST=
```

/// POLYGON LABEL DECK ///

A MASTER LABEL FILE IS NOT AVAILABLE

```
INPUT CARD' 530 2435 1760,530 2020 710,
INPUT CARD' 999 892 486,999 339 1138,999 1487 1417,
INPUT CARD' 570 536 870,530 750 1140,520 804 1146,530 866 1146,
INPUT CARD' 530 1125 1066,570 1154 999,520 1209 1014,530 1138 936,
INPUT CARD' 570 1145 865,530 1121 807,570 1202 822,530 371 1567,
INPUT CARD' 570 1504 170,530 1381 410,570 1407 441,520 1413 404,
INPUT CARD' 530 1409 368,530 1449 376,570 1453 422,530 1533 525,
INPUT CARD' 530 1690 590,570 1740 641,530 1755 689,570 1824 707,
INPUT CARD' 530 1859 739,570 1912 761,530 1915 806,
INPUT CARD' 530 1899 892,520 2035 738,570 2001 878,520 2210 798,
INPUT CARD' 530 2231 764,530 2146 858,570 2171 846,530 2186 876,
INPUT CARD' 530 2230 859,570 2255 848,530 2205 974,530 1697 278,
INPUT CARD' 570 1713 314,530 1761 331,570 1808 342,570 1818 208,
INPUT CARD' 520 2020 428,570 1934 338,530 1979 158,570 1992 280,
INPUT CARD' 570 2035 238,530 1895 496,570 1993 499,530 2164 302,
INPUT CARD' 570 2425 306,530 2318 380,530 2370 327,520 2367 238,
INPUT CARD' 530 2455 232,570 2330 224,999 2366 160,530 2183 206,
INPUT CARD' 570 2227 149,570 2431 647,570 2333 840,530 2381 861,
```

ST.JOE MAP 59 HABITAT

POLLY 13 MAR 80 00:48:43 5 4

```
INPUT CARD' 570 2338 1070,530 2104 1224,999 2324 1228,530 2436 1392,
INPUT CARD' 530 2441 1755 $
```

/// 74 SORTED LABELS ///

DECK POSITION	LABEL CODE	X COORD	Y COORD	LABEL
74	1	1	641	PERIMETER
1	2	2435	1760	530
73	2	2441	1755	530
17	2	371	1567	530
5	3	1487	1417	999
72	2	2436	1392	530
71	3	2324	1228	999
70	2	2104	1224	530
9	2	866	1146	530
8	5	804	1146	520
7	2	750	1140	530
4	3	339	1138	999
69	4	2338	1070	570
10	2	1125	1066	530
12	5	1209	1014	520
11	4	1154	999	570
43	2	2205	974	530
13	2	1138	936	530
33	2	1899	892	530
35	4	2001	878	570
40	2	2186	876	530
6	4	536	870	570
14	4	1145	865	570
68	2	2381	861	530
41	2	2230	859	530
38	2	2146	858	530
42	4	2255	848	570
39	4	2171	846	570
67	4	2333	840	570
16	4	1202	822	570
15	2	1121	807	530
32	2	1915	806	530
36	5	2210	798	520
37	2	2231	764	530
31	4	1912	761	570
30	2	1859	739	530
34	5	2035	738	520
2	2	2020	710	530
29	4	1824	707	570
28	2	1755	689	530
66	4	2431	647	570
27	4	1740	641	570
26	2	1690	590	530
25	2	1533	525	530
55	4	1993	499	570
54	2	1895	496	530
3	3	892	486	999
20	4	1407	441	570
49	5	2020	428	520
24	4	1453	422	570
19	2	1381	410	530
21	5	1413	404	520
58	2	2318	380	530

23	2	1449	376	530
22	2	1409	368	530
47	4	1808	342	570
50	4	1934	338	570
46	2	1761	331	530
59	2	2370	327	530
45	4	1713	314	570
57	4	2425	306	570
56	2	2164	302	530
52	4	1992	280	570
44	2	1697	278	530
60	5	2367	238	520
53	4	2035	238	570
61	2	2455	232	530
62	4	2330	224	570
48	4	1818	208	570
64	2	2183	206	530
18	4	1504	170	570
63	3	2366	160	999
51	2	1979	158	530
65	4	2227	149	570

ST.JOE MAP 59 HABITAT

POLLY 13 MAR 80 00:48:43 5 6

POLLY 0.5869 SEC

THINNING: 6 SECONDS 3 PASSES

POLLY 6.1518 SEC

F.51

/// OUTPUT HEADER RECORD ///
FOREST = ST.JOE; MAP = 59; LAYER = HABITAT; LOCATION = TENSED; SCALE = 31680;
GEOGRAPHIC CONTROL POINTS = 47.00000, 117.0000, 47.12500, 117.0000, 47.12500, 116.7500, 47.00000, 116.7500;
MAP CONTROL POINTS = 101, 117, 102, 1857, 2460, 1831, 2463, 101; GRID CONTROL POINTS = 39, 33, 25, 876, 1164, 892, 1180, 54;
ZONE = 3; STATE = IDAHO; SCAN ROWS = 1283; SCAN COLUMNS = 928; MODE = 2; ENVELOPE = 98, 98, 1850, 2465;
DATE WRITTEN = 26 JUL 77; TIME WRITTEN = 02:10:21; REEL NUMBER = CC3902

/// LOCAL LABEL LIST ///
1 PERIMETER 4 570
2 530 5 520
3 999

1 3 82.61 409.4426 174 14.51 1.06 1.00 24.65 1.01 18.57 13.46 0.20 PERIMETER
2 3 2.52 0.3083 27 24.36 17.86 24.21 24.62 17.15 18.11 24.35 17.60 530

***** DEADEND ENCOUNTERED *****

DEADEND AT ROW 1153,COLUMN 857 X= 2436, Y= 1759

POLYGON LABEL AT ROW 1155,COLUMN 855

LABEL NUMBER 73,LABEL 2,X= 2441,Y= 1755,MAP LABEL 530

********** THE FOLLOWING LABEL IS WITIN 5 HUNDRETHS OE THE DEAD END **********

LABEL NUMBER 1,LABEL 2,X= 2435,Y= 1760,MAP LABEL 530

3	3	1.14	0.0525	20	3.81	15.78	3.62	3.83	15.35	15.78	3.71	15.67	530
4	3	121.87	198.1772	1019	15.37	18.40	1.00	24.65	1.04	18.57	14.87	14.17	999
5	3	2.03	0.2600	11	24.61	14.20	24.09	24.61	13.69	14.21	24.36	13.92	530
6	3	14.19	7.6152	196	23.26	13.70	21.24	24.63	9.72	14.17	23.24	12.28	999
7	3	1.82	0.1809	26	21.25	12.55	20.74	21.25	12.06	12.56	21.04	12.24	530
8	3	2.16	0.2729	23	8.89	11.73	8.29	8.95	11.22	11.74	8.66	11.46	530
9	3	2.62	0.3351	37	8.09	11.75	7.53	8.47	11.24	11.75	8.04	11.46	520
10	3	2.01	0.1860	29	7.53	11.66	7.04	7.81	11.25	11.66	7.50	11.40	530
11	3	29.75	40.4037	379	3.46	15.85	1.00	7.90	6.74	16.73	3.39	11.38	999
12	3	10.60	2.8549	76	23.90	11.18	22.74	24.63	7.68	11.21	23.38	10.70	570
13	3	4.93	1.1730	75	11.29	11.34	10.85	11.96	9.86	11.59	11.25	10.66	530
14	3	7.27	0.5715	138	12.10	10.35	11.23	12.69	9.42	11.54	12.09	10.14	520
15	3	3.14	0.3191	70	11.54	10.24	10.89	11.97	9.55	10.25	11.54	9.99	570
16	3	3.49	0.5769	20	22.74	10.00	21.39	22.74	9.52	10.03	22.05	9.74	530
17	3	5.15	1.1219	102	11.39	9.81	10.86	12.04	8.56	10.12	11.38	9.36	530
18	3	2.43	0.2404	55	19.00	9.18	18.74	19.36	8.39	9.18	18.99	8.92	530
19	3	18.03	4.4059	301	20.22	9.52	18.67	21.72	7.47	10.04	20.01	8.78	570
20	3	1.94	0.1119	41	21.91	9.01	21.76	22.04	8.20	9.01	21.86	8.76	530
21	3	6.03	2.0019	17	5.92	9.76	4.90	5.92	7.75	9.78	5.36	8.70	570
22	3	2.83	0.3046	68	11.47	8.83	11.01	12.04	8.37	9.11	11.45	8.65	570
23	3	4.64	0.6036	72	23.82	9.02	23.54	24.48	7.68	9.21	23.81	8.61	530
24	3	1.74	0.0929	32	22.30	8.73	22.18	22.43	8.19	8.83	22.30	8.59	530
25	3	1.92	0.1122	32	21.58	9.01	21.39	21.60	8.23	9.02	21.46	8.58	530
26	3	5.29	0.5923	73	22.72	9.01	21.91	22.73	7.99	9.03	22.55	8.48	570
27	3	2.76	0.2942	61	21.79	9.03	21.53	22.00	8.00	9.03	21.71	8.46	570
28	3	2.19	0.2973	24	23.48	8.70	23.04	23.66	8.18	8.72	23.33	8.40	570
29	3	3.05	0.2607	30	12.09	8.49	11.37	12.17	7.61	8.53	12.02	8.22	570
30	3	8.12	1.2237	110	11.22	8.39	10.86	12.68	7.62	10.09	11.21	8.07	530
31	3	4.07	0.4249	76	19.23	8.25	18.67	19.80	7.20	8.32	19.15	8.06	530
32	3	5.41	0.3659	126	22.12	8.09	20.81	22.72	7.52	8.23	22.10	7.98	520
33	3	3.89	0.5068	57	22.39	7.94	21.12	22.72	7.50	7.94	22.31	7.64	530
34	3	3.00	0.5095	64	19.24	7.94	18.66	19.57	7.17	8.03	19.12	7.61	570

ITEM	TYPE	LENGTH	AREA	PTS	FIRST POINT		RANGE OF X,		RANGE OF Y		LABEL LOC		POLLY LABEL
35	3	2.41	0.1889	46	18.66	7.54	18.26	19.23	7.13	7.58	18.59	7.39	530
36	3	10.28	0.8216	181	20.36	8.01	19.21	20.82	7.02	9.45	20.35	7.38	520
37	3	2.27	0.2048	22	20.29	7.27	19.77	20.68	7.00	7.28	20.20	7.10	530
38	3	4.71	0.8420	69	18.24	7.53	17.55	19.21	6.53	7.54	18.24	7.07	570
39	3	3.23	0.3539	55	17.55	7.09	17.15	18.16	6.54	7.39	17.55	6.89	530
40	3	2.12	0.2875	7	24.61	6.71	24.06	24.63	6.19	6.72	24.31	6.47	570
41	3	4.13	0.4986	61	17.40	6.79	16.67	17.77	5.62	6.87	17.40	6.41	570
42	3	4.42	0.8943	44	16.92	6.41	16.16	17.63	5.54	6.49	16.90	5.90	530
43	3	4.00	0.7497	16	15.87	5.54	14.66	16.18	5.04	5.57	15.33	5.25	530
44	3	19.12	3.5857	283	19.97	5.52	18.66	23.01	2.94	5.55	19.93	4.99	570
45	3	2.58	0.3046	69	18.95	5.18	18.67	19.44	4.57	5.36	18.95	4.96	530
46	3	56.33	112.3712	485	10.86	11.47	1.01	17.18	1.06	11.52	8.92	4.86	999
47	3	2.03	0.1957	30	14.42	4.57	13.67	14.44	4.20	4.59	14.07	4.41	570
48	3	17.42	2.1271	385	20.20	4.49	17.66	21.73	1.02	4.62	20.20	4.28	520
49	3	1.49	0.1051	18	14.57	4.48	14.38	14.67	3.94	4.52	14.53	4.22	570
50	3	2.21	0.2095	37	13.92	4.31	13.66	14.04	3.57	4.36	13.81	4.10	530
51	3	4.54	0.2802	96	14.13	4.23	13.85	14.65	3.56	4.57	14.13	4.04	520
52	3	4.50	0.6687	89	23.88	4.19	22.74	23.90	2.79	4.21	23.18	3.80	530
53	3	1.67	0.1456	35	14.49	3.95	14.25	14.68	3.56	4.08	14.49	3.76	530
54	3	1.09	0.0667	19	14.12	3.90	13.95	14.24	3.56	3.90	14.09	3.68	530
55	3	1.72	0.0980	35	18.15	3.53	17.68	18.42	3.32	3.55	18.08	3.42	570
56	3	2.45	0.2044	57	19.38	3.72	19.17	19.59	2.75	3.76	19.34	3.38	570
57	3	2.82	0.2869	67	17.61	3.52	16.93	18.05	3.00	3.55	17.61	3.31	530
58	3	4.24	0.5251	74	23.70	3.53	23.08	24.08	2.49	4.17	23.70	3.27	530
59	3	2.99	0.3830	69	17.13	3.37	16.74	17.81	2.82	3.54	17.13	3.14	570
60	3	15.12	2.7472	241	24.62	4.17	20.99	24.65	2.17	4.19	24.25	3.06	570
61	3	4.49	0.6782	85	21.96	3.27	20.75	22.72	2.72	3.27	21.64	3.02	530
62	3	2.62	0.2192	72	19.92	3.03	19.68	20.26	2.31	3.33	19.92	2.80	570
63	3	2.71	0.3233	34	16.98	3.04	16.75	17.68	2.60	3.15	16.97	2.78	530
64	3	1.94	0.2195	33	23.69	2.60	23.29	23.97	2.20	2.62	23.67	2.38	520
65	3	2.77	0.3274	64	20.37	2.67	19.76	20.80	2.06	2.69	20.35	2.38	570
66	3	1.02	0.0503	17	24.55	2.52	24.47	24.64	2.21	2.60	24.55	2.32	530
67	3	0.48	0.0138	14	23.31	2.30	23.22	23.39	2.20	2.32	23.30	2.24	570
68	3	7.01	1.6332	112	18.21	3.05	17.75	19.10	1.04	3.07	18.18	2.08	570
69	3	5.22	0.8900	99	21.84	2.38	21.17	23.29	1.59	2.47	21.83	2.06	530
70	3	6.01	1.1029	31	15.08	2.10	14.26	16.24	1.06	2.12	15.04	1.70	570
71	3	6.20	2.2446	23	24.05	2.20	22.72	24.65	1.01	2.23	23.66	1.60	999
72	3	17.43	4.7580	363	19.80	2.08	18.39	21.22	1.02	4.29	19.79	1.58	530
73	3	4.51	1.0641	59	22.31	2.06	21.39	22.76	1.02	2.20	22.27	1.49	570

POLLY 7.9383 SEC

NUMBER OF LABELS READ 74
NUMBER OF POLYGONS WRITTEN 73
AREA OF ENCLOSING POLYGON 409.4426
AREA OF ENCLOSED POLYGONS 409.4231
ENCLOSING POLYGON EXCEEDS ENCLOSED POLYGONS BY 0.020
THIS IS AN ERROR OF 1 PART IN 20963

MEASUREMENTS FOR CHECKING SCALE AND CONTROL POINTS
DISTANCE FROM CONTROL POINT 1 TO CONTROL POINT 3 IN MAP COORDINATES IS 2912
DISTANCE FROM CONTROL POINT 2 TO CONTROL POINT 4 IN MAP COORDINATES IS 2939

POLLY 0.0110 SEC

DATE 13 MAR 80 TIME 00:49:30

END OF RUN

F.8 TONIC

```
                                                                                                TONIC       14 MAR 80  05:00:19     0      1
                                        INPUT CARD' FILES: INPUT=WRIS01; OUTPUT=NONE$

INPUT
   REEL WRIS01


OUTPUT
   'NONE'
                                        INPUT CARD' HEADER: FOREST=ST.JOE; MAP=59; LAYER=HABITAT$
                                        INPUT CARD' OPTIONS: SKIPS=3$
                                        INPUT CARD' HEADER UPDATES: FOREST=ST.JOE; MAP=59; LAYER=HABITAT;

PREPARING TO READ INPUT FILE FROM  REEL WRIS01
   POSITION 4   ST.JOE  HABITAT  MAP 59  TENSED   14 AUG 79  20:49:23    8086 WORDS  .095 SECONDS

NUMBER OF POLYGONS: 73   NUMBER OF X-Y POINTS: 7257   AVERAGE NUMBER OF X-Y POINTS PER POLYGON: 99

HEADER RECORD
   FOREST = ST.JOE;   MAP = 59;   LAYER = HABITAT;   LOCATION = TENSED;   SCALE = 31680;
   GEOGRAPHIC CONTROL POINTS = 47.00000, 117.0000, 47.12500, 117.0000, 47.12500, 116.7500, 47.00000, 116.7500;
   MAP CONTROL POINTS = 101, 117, 102, 1857, 2460, 1831, 2463, 101;   GRID CONTROL POINTS = 39, 33, 25, 876, 1164, 892, 1180, 54;
   ZONE = 3;   STATE = IDAHO;   SCAN ROWS = 1283;   SCAN COLUMNS = 928;   MODE = 2;   ENVELOPE = 98, 98, 1850, 2465;
   DATE WRITTEN = 14 AUG 79;   TIME WRITTEN = 20:49:23;   REEL NUMBER = C10598;   POSITION ON REEL = 2

LABELS
   1 PERIMETER   4 570
   2 530         5 520
   3 999
                                        INPUT CARD' LOCATION=TENSED$

UPDATED HEADER RECORD
   FOREST = ST.JOE;   MAP = 59;   LAYER = HABITAT;   LOCATION = TENSED;   SCALE = 31680;
   GEOGRAPHIC CONTROL POINTS = 47.00000, 117.0000, 47.12500, 117.0000, 47.12500, 116.7500, 47.00000, 116.7500;
   MAP CONTROL POINTS = 101, 117, 102, 1857, 2460, 1831, 2463, 101;   GRID CONTROL POINTS = 39, 33, 25, 876, 1164, 892, 1180, 54;
   ZONE = 3;   STATE = IDAHO;   SCAN ROWS = 1283;   SCAN COLUMNS = 928;   MODE = 2;   ENVELOPE = 98, 98, 1850, 2465;
   DATE WRITTEN = 14 AUG 79;   TIME WRITTEN = 20:49:23;   REEL NUMBER = C10598;   POSITION ON REEL = 2

                                        INPUT CARD' LABEL COMBINATIONS: 500=510,520,530$

NEW LABEL LIST
   1 PERIMETER
   2 500
   3 999
   4 570


                                        INPUT CARD' NEW LABELS: 2,PVT; 3,880$

                                        INPUT CARD' NEW LABELS BY LOCATION: 999 1487 1417, 998 339 1138$

                                        INPUT CARD' NEW LABEL LOCATIONS: 4,1480,1410; 11,340,1140$
```

F.56

ST.JOE MAP 59 HABITAT TONIC 14 MAR 80 05:01:15 2 2

ITEM	LABEL LOCATION		LINE LENGTH (FEET)	AREA (ACRES)	LABEL
1	13.46	0.20	218100	65511	PERIMETER
2	24.35	17.60	6641	49	PVT
3	3.71	15.67	3013	8	880
4	14.80	14.10	321737	31708	999
5	24.36	13.92	5364	42	500
6	23.24	12.28	37471	1218	999
7	21.04	12.24	4800	29	500
8	8.66	11.46	5711	44	500
9	8.04	11.46	6906	54	500
10	7.50	11.40	5301	30	500
11	3.40	11.40	78542	6465	998
12	23.38	10.70	27981	457	570
13	11.25	10.66	13002	188	500
14	12.09	10.14	19204	91	500
15	11.54	9.99	8301	51	570
16	22.05	9.74	9225	92	500
17	11.38	9.36	13595	180	500
18	18.99	8.92	6424	38	500
19	20.01	8.78	47607	705	570
20	21.86	8.76	5127	18	500
21	5.36	8.70	15911	320	570
22	11.45	8.65	7483	49	570
23	23.81	8.61	12244	97	500
24	22.30	8.59	4597	15	500
25	21.46	8.58	5074	18	500
26	22.55	8.48	13957	95	570
27	21.71	8.46	7294	47	570
28	23.33	8.40	5791	48	570
29	12.02	8.22	8054	42	570
30	11.21	8.07	21441	196	500
31	19.15	8.06	10734	68	500
32	22.10	7.98	14272	59	500
33	22.31	7.64	10269	81	500
34	19.12	7.61	7923	82	570
35	18.59	7.39	6361	30	500
36	20.35	7.38	27151	131	500
37	20.20	7.10	5998	33	500
38	18.24	7.07	12429	135	570
39	17.55	6.89	8540	57	500
40	24.31	6.47	5585	46	570
41	17.40	6.41	10914	80	570
42	16.90	5.90	11675	143	500
43	15.33	5.25	10573	120	500
44	19.93	4.99	50487	574	570
45	18.95	4.96	6820	49	500
46	8.92	4.86	148707	17979	999
47	14.07	4.41	5353	31	570
48	20.20	4.28	45980	340	500
49	14.53	4.22	3928	17	570
50	13.81	4.10	5830	34	500
51	14.13	4.04	11994	45	500
52	23.18	3.80	11882	107	500
53	14.49	3.76	4412	23	500
54	14.09	3.68	2886	11	500

ITEM	LABEL LOCATION		LINE LENGTH (FEET)	AREA (ACRES)	LABEL
55	18.08	3.42	4529	16	570
56	19.34	3.38	6463	33	570
57	17.61	3.31	7447	46	500
58	23.70	3.27	11196	84	500
59	17.13	3.14	7884	61	570
60	24.25	3.06	39909	440	570
61	21.64	3.02	11865	109	500
62	19.92	2.80	6919	35	570
63	16.97	2.78	7145	52	500
64	23.67	2.38	5123	35	500
65	20.35	2.38	7307	52	570
66	24.55	2.32	2694	8	500
67	23.30	2.24	1277	2	570
68	18.18	2.08	18499	261	570
69	21.83	2.06	13785	142	500
70	15.04	1.70	15874	176	570
71	23.66	1.60	16380	359	999
72	19.79	1.58	46013	761	500
73	22.27	1.49	11912	170	570

AGGREGATE AREAS BY LABEL

PERIMETER	65511
500	3697
999	51265
570	4024
PVT	49
880	8
998	6465
	131019 TOTAL

DATE 14 MAR 80 TIME 05:01:16

END OF RUN

F.9 XCHG

```
                                                                    XCHG        15 FEB 80  12:16:42    0      1
                                    INPUT CARD' FILES: INPUT=WRIS01$


INPUT
   REEL WRIS01
                                    INPUT CARD' HEADER: FOREST=ST.JOE;LAYER=HABITAT;MAP=59$
                                    INPUT CARD' HEADER UPDATES: FOREST=ST.JOE;LAYER=HABITAT;MAP=59;
                                    INPUT CARD' LOCATION=TENSED$
                                    INPUT CARD' OPTIONS: SKIPS=3$
                                    INPUT CARD' POLYGON SELECTIONS: INCLUDE ITEMS=2:8$

PREPARING TO READ INPUT FILE FROM  REEL WRIS01
   POSITION 4   ST.JOE  HABITAT  MAP 59  TENSED   14 AUG 79  20:49:23    8086 WORDS  .103 SECONDS

NUMBER OF POLYGONS: 73   NUMBER OF X-Y POINTS: 7257   AVERAGE NUMBER OF X-Y POINTS PER POLYGON: 99

HEADER RECORD
   FOREST = ST.JOE;   MAP = 59;   LAYER = HABITAT;   LOCATION = TENSED;   SCALE = 31680;
   GEOGRAPHIC CONTROL POINTS = 47.00000, 117.0000, 47.12500, 117.0000, 47.12500, 116.7500, 47.00000, 116.7500;
   MAP CONTROL POINTS = 101, 117, 102, 1857, 2460, 1831, 2463, 101;   GRID CONTROL POINTS = 39, 33, 25, 876, 1164, 892, 1180, 54;
   ZONE = 3;   STATE = IDAHO;   SCAN ROWS = 1283;   SCAN COLUMNS = 928;   MODE = 2;   ENVELOPE = 98, 98, 1850, 2465;
   DATE WRITTEN = 14 AUG 79;   TIME WRITTEN = 20:49:23;   REEL NUMBER = C10598;   POSITION ON REEL = 2

LABELS
   1 PERIMETER   4 570
   2 530         5 520
   3 999

UPDATED HEADER RECORD
   FOREST = ST.JOE;   MAP = 59;   LAYER = HABITAT;   LOCATION = TENSED;   SCALE = 31680;
   GEOGRAPHIC CONTROL POINTS = 47.00000, 117.0000, 47.12500, 117.0000, 47.12500, 116.7500, 47.00000, 116.7500;
   MAP CONTROL POINTS = 101, 117, 102, 1857, 2460, 1831, 2463, 101;   GRID CONTROL POINTS = 39, 33, 25, 876, 1164, 892, 1180, 54;
   ZONE = 3;   STATE = IDAHO;   SCAN ROWS = 1283;   SCAN COLUMNS = 928;   MODE = 2;   ENVELOPE = 98, 98, 1850, 2465;
   DATE WRITTEN = 14 AUG 79;   TIME WRITTEN = 20:49:23;   REEL NUMBER = C10598;   POSITION ON REEL = 2

LABELS WILL BE WRITTEN TO THE EXCHANGE FILE.

CO-ORDINATES WRITTEN TO EXCHANGE FILE WILL BE ADJUSTED BY SUBTRACTING 97 FROM X AND 97 FROM Y.

DATE  15 FEB 80     TIME  12:19:03

END OF RUN
```

THE FOLLOWING IS A LIST OF THE UNIVERSAL DATA EXCHANGE FORMAT PRODUCED BY "XCHG".

```
ST.JOE                                  TENSED   HABITAT
     7     2 31680     4     1     1  1753  2368 41469     1WRIS
     4    20  47000000 117000000     5  1760  47124992 117000000
  2363  1734  47124992 116750000  2366     4  47000000 116750000
530                    999
3   1   27    1 2338 1663 2324 1618 2365 1714    30
233916892339169123421693234216952344169723441699234817032348170523501707235017090
235417142363171323621709236517072363161823261619232416212324166723271669232716710
232916732329167523331679233316812335168323351685233916890
3   2   20    1  274 1470  265 1438  286 1481     5
 2841481 2861478 2841476 2841472 2821470 2821468 2801466 2791464 2771462 2771460
 2751458 2751454 2731452 2731446 2711444 2711442 2671438 2651440 2651481 2841481
3   3 1019    2 1390 1320    3    7 2368 1760 19817
144017431442174516031741160517431744173917461741189117381893174018971739189917371
190517371908173920571735205917372212173422141736233817332340173523611734236317321
236317132354171423501709235017072348170523481703234416992344169723421695234216932
233916912339168723371687233516852335168323331681233316792329167523291673232716710
232716692324166723241621232616192363161823631610236516082363149723651494236314021
236513992364132323141324231013202308132023041316230213162298131222961312229313101
229113112287130622851307228113032279130322771301227513012273129922701299226612951
226412952262129322601293225612892254128922501285224712852245128322431283223912791
223712792233127522311275222912732227127322221269222012692216126522141265221212631
221012632206125922041259219912552197125521951253219312532189124921871249218512471
218312472178124321761243217412412172124121681237216612372164123521621235215812311
215512312153122921511229214712252145122521411221213912212137121921351219213012151
212812162124121121221212212012102118121021141206211212062107120221051202210312001
210112002097119620951196209111922089119220861190208411902080118620781186207611841
207411842070118020681180206511782063117820591174205711742055117220531172204911681
204711682045116620431166203811622036116220341160203211602030115820051159200311571
200311552001115320011151199911491999114719941142199411401992113819921136199011341
199011321986112819861126198411241984112219821120198211181977111419771110201711091
201911112027111120311106203311062035110420371104203911022041110220451098204810981
205010962052109620541094205610932058109120601091206210892064108920661087206810871
207010852072108520761081207810812080107820821078208410762087107620891074209110741
209310722095107220971070209910702103106521051065210710632109106321111061211310611
211510592117105921211055212310552125105321281052213010502132105021341048213610481
213810462140104621421044214410442148104021501040215210372154103721561035215210331
216010332162103321641031216610312168102921711029217310272175102721791022217 925
2179 9232237 9222239 9242258 9232258 9132260 9112258 8302260 8282260 8242258 822
2258 8102260 8082260 8012258 7992257 7752253 7752251 7732212 7742207 7702207 724
2209 7222244 7212246 7232254 7232256 7212263 7212265 7232308 7222310 7202309 674
2311 6722365 6712364 6032366 6012366 5762364 5742314 5752310 5712309 5242365 522
2365 5122367 5102365 4172367 4152365 3282368 3262367 3222365 3202299 3222297 320
2293 3202291 3222173 3252171 3232170 2552155 2552153 2532041 2562039 2541973 255
1971 2581971 2701969 2721971 3901969 3921970 4561902 4571900 4551800 4581798 456
1771 4571769 4551769 4131771 4111770 3621772 3601770 3581769 3221771 3201770 256
1768 2541766 2561758 2571755 2551745 2551743 2571720 2581718 2561673 2571671 255
1664 2551662 2571615 2581613 2561598 2571596 2551594 2551592 2571580 2571577 255
1577 2301579 2281579 2201581 2181579 2161578 1661580 1641611 1631613 1651679 164
1679 1551681 1531681 1491679 1471678 1041680 1021679  151726  141726   81664   9
1662   71546  101544   81445  111443   91428   91429  611431  631468  621471  64
1524  621527  641527 1101525 1121525 1141503 1141500 1121413 1151411 1131378 113
1378 1181376 1201376 1301374 1321375 1421373 1451373 1531371 1551371 1651369 167
1369 1741367 1761367 1861365 1881365 1961363 1981363 2071361 2091361 2171359 219
1360 2271358 2301358 2381356 2401356 2461354 2481354 2591356 2611368 2601371 262
1371 2751369 2771370 3531368 3551368 3591374 3651374 3671377 3691377 3721379 374
1379 3781381 3801381 3821383 3841383 3861385 3881385 3921387 3941387 3981389 400
```

```
1390 4041392 4061392 4081394 4101520 4071521 4501519 4531519 4591587 4571589 459
1666 4571666 4651668 4671670 5561672 5581767 5561769 5581770 6031772 6051803 604
1805 6061944 6031946 6051971 6041971 6521976 6562077 6532079 6552172 6532174 655
2176 7482174 7502175 8042096 8062094 8042084 8042082 8062065 8062063 8042030 805
2028 8072029 8382027 8402027 8532031 8572101 8552103 8572176 8552177 9032044 906
2042 9041976 9061972 9021971 8911974 8891973 8791971 8771971 8731973 8711973 856
1927 8571925 8551874 8571872 8591872 9041870 9061845 9071843 9051843 9031839 899
1839 8971837 8951837 8931833 8891833 8861831 8841831 8821826 8781826 8761824 874
1824 8721820 8681820 8661818 8641818 8621814 8581814 8561811 8541811 8521807 848
1807 8461805 8441805 8421801 8381801 8361797 8321797 8301794 8281794 8261792 823
1792 8211788 8171788 8151784 8111784 8091782 8071782 8051777 8011777 7931773 793
1771 7911770 7081772 7061769 7041769 6711771 6691771 6591769 6571731 6581729 656
1686 6571682 6531682 6511679 6491679 6471675 6431675 6411673 6391673 6371669 633
1669 6301665 6261665 6241662 6221662 6201658 6161658 6121642 6131640 6151635 615
1629 6211629 6271627 6291627 6321625 6341625 6381619 6441619 6461615 6501611 651
1609 6531603 6531601 6551597 6551595 6571591 6571589 6591584 6591582 6621578 662
1576 6641572 6641570 6661566 6661564 6681560 6681558 6701554 6711552 6731549 673
1547 6751541 6751539 6771535 6771533 6791529 6791527 6821523 6821521 6841517 684
1514 6861510 6861508 6881504 6881502 6901498 6911496 6931492 6931490 6951486 695
1484 6971479 6971477 6991473 6991471 7011467 7021465 7041461 7041459 7061455 706
1453 7081449 7081447 7101445 7101442 7131438 7131436 7151430 7151428 7171426 717
1424 7191420 7191418 7211414 7221412 7241407 7241405 7261401 7261399 7281395 728
1393 7301389 7301387 7331383 7331381 7351377 7351375 7371370 7371368 7391364 739
1362 7411358 7411356 7441352 7441350 7461346 7461344 7481342 7481340 7501335 750
1333 7521329 7531327 7551323 7551321 7571317 7571315 7591311 7591309 7611305 761
1303 7641298 7641296 7661292 7661290 7681286 7681284 7701280 7701278 7721274 773
1272 7751268 7751266 7771263 7771261 7791257 7791255 7811251 7811249 7831245 784
1243 7861239 7861237 7881233 7881231 7901226 7901224 7921220 7921218 7951214 795
1212 7971208 7971206 7991202 7991200 8011196 8011194 8031189 8041187 8061185 806
1183 8081179 8081177 8101175 8101171 8141172 8871170 8871168 8891164 8891162 891
1162 8931160 8951160 8971156 9011156 9031150 9101150 9121144 9181142 9181136 925
1134 9251127 9311125 9311123 9331121 9331119 9351115 9351113 9381113 9401111 942
1111 9561109 9581109 9691107 9711108 9791106 9811106 9871104 9891104 9911098 998
1095 998108310111081101110691023106710231055103610531036104010491038104910301057
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 7941074 7921076 7341077 7321075 7141076 7121078 6931078 6931080 6871087 6851087
 6791093 6771093 6691101 6671101 6561112 6541112 6481118 6461119 6361129 6341129
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Deschene, Wallace A.

1980. User's manual: RID*POLY geographic information system. USDA For. Serv. Gen. Tech. Rep. INT-105, 144p. Intermt. For. and Range Exp. Stn., Ogden, Utah 84401.

User's guide provides detailed information about the RID*POLY (WRIS) geographic information system. Explains how to prepare maps, digitize and scan input, and code control cards to operate the RID*POLY programs. Component programs in the system overlay map layers (MOSAIC), combine map layers (MERGE), edit map-files (TONIC), plot map-files (CHART), produce data in the Universal Data Exchange Format (XCHG), and convert data to grid format (PGRID).

KEYWORDS: WRIS, RID*POLY, RID*GRID, geographical information systems, computer mapping, management information systems

The Intermountain Station, headquartered in Ogden, Utah, is one of eight regional experiment stations charged with providing scientific knowledge to help resource managers meet human needs and protect forest and range ecosystems.

The Intermountain Station includes the States of Montana, Idaho, Utah, Nevada, and western Wyoming. About 231 million acres, or 85 percent, of the land area in the Station territory are classified as forest and rangeland. These lands include grasslands, deserts, shrublands, alpine areas, and well-stocked forests. They supply fiber for forest industries; minerals for energy and industrial development; and water for domestic and industrial consumption. They also provide recreation opportunities for millions of visitors each year.

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